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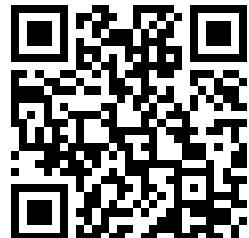
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The School World

A MONTHLY MAGAZINE OF
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SIXPENCE.

COMMON-SENSE METHODS IN ARITHMETIC AND ALGEBRA.

By GEORGE A. GIBSON, M.A., LL.D., F.R.S.E.

Professor of Mathematics, Glasgow and West of Scotland Technical College.

THE reports of the examiners in the Oxford Local examinations, summarised in THE SCHOOL WORLD for October, 1906, pp. 378-381, raise several questions that are of interest to teachers, and I propose in this article to discuss one question that is of fundamental importance to the teacher of mathematics. In the notes on the handling of problems in permutations and combinations, the examiners remark that (p. 381) "Candidates should be taught that these questions are entirely questions of common sense and not of formulæ"; and they add, "It may also be remarked that all through there seemed to be too much use of formulæ rather than of the applications of first principles." These two sentences call for the serious consideration of teachers of mathematics, and it is the principle implied in them that I propose to discuss.

It is probable that every type of blunder referred to by the examiners is quite familiar to teachers, so that the value of the report does not lie in the specification of the blunders; its value is rather due to the evidence thus furnished that the difficulties experienced by all pupils are to a very large extent identical. When it is considered that the examinees are drawn from widely separated schools and are taught by teachers of very different aptitudes and training, it is rather remarkable that the types of error are so constant. This constancy of type seems to indicate that the mistakes are "natural," and at once suggests the question whether it is possible to discover a definite reason for the presence and persistence of such mistakes. After all allowance is made for mere carelessness on the part of individuals there still remains a large proportion of gross blunders that can only be accounted for on general rather than on individual grounds. To what general source is this state of things to be traced? Is a common type of mistake due to a neglect of common sense?

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There is, I think, little doubt that one of the most perplexing of a teacher's difficulties is the persistent failure of a pupil to observe precautions and admonitions of the most common-sense kind. The facts, as stated in the report and confirmed, I believe, by a teacher's daily experience, indicate that pupils are prone to trust to formulæ which they apply mechanically, and to give no heed to the general principles on which the formulæ are based and which condition their application. In some parts of mathematics—for example, in the field of permutations and combinations, specially referred to in the report—the mechanical use of formulæ is peculiarly liable to lead to wrong results; but the tendency to trust to formulæ is so general in all parts of mathematics that the explanation of that tendency and the means of controlling it must be sought for outside any special subject of the mathematical curriculum. The tendency is, I believe, due to a habit or attitude of mind that is fostered by an arithmetical training in which mere working by rules occupies too prominent a place, and can only be effectively checked by a change in the teaching of arithmetic.

If algebra is to be treated as generalised arithmetic—and there is practically universal agreement on this point—it seems reasonable to suppose that the pupil, before beginning the study of algebra, should have definite conceptions of the meaning of the processes of ordinary arithmetic. It is necessary, but it is not sufficient, that he should be able to perform correctly the various transformations required to reduce an arithmetical expression to its simplest form. As experience shows, it is quite possible to teach children the rules of arithmetic in such a way that they can work correctly difficult arithmetical examples while at the same time they have no real grasp of the foundation in common sense of the rules they apply. Without such grasp the pupils are unable to use the rules to the best advantage, and they have nothing to guide them in selecting the best method when more methods than one are available. The simplification of fractions, for example, offers many opportunities for the intelligent application of the rule that a fraction is not altered in value when numerator and denominator are multiplied by the same

number; yet the great majority of pupils blindly follow some stereotyped process of reducing a complex fraction to its simplest form. The chief reason for their unintelligent work seems to me to lie in the absence of a firm grasp of the rule itself. The same characteristic of rigid adherence to a set of rules can be traced through a great part of arithmetical practice, and is, I am persuaded, due to the same cause. It is here that the explanation is to be found (in part at least, for no one cause can bear the whole responsibility) of the constant neglect to check a result by a rough preliminary calculation, or by comparison with what common sense would lead one to expect. The teacher may, in the words of the report (p. 378), "insist on the invariable consideration of an answer as to its reasonableness," but no amount of insistence will have much weight with a pupil who thinks he has "followed the rule." The mental outlook of such a pupil is too narrow for him to consider anything beyond the application of a rule, and when he makes a slip he has no resources from which to draw so that he may correct or even detect it, except, it may be, by merely going over his figures again.

Another feature of arithmetical teaching that is usually associated with excessive devotion to working by rules is the predominance of mechanical schemes or devices for the carrying out of operations, to the exclusion of chains of expressions connected by the proper symbols of operation. The operations which may be performed on an expression without altering its value while changing its form are not emphasised; the science of arithmetical operations is not developed, but the acquisition of practical facility in applying rules absorbs the whole energy of the pupil. The attainment of such facility is very desirable, but in order to attain such facility, it is not necessary to neglect the study of the operations themselves and thus lose valuable opportunities of training the pupil to appreciate simple forms of abstract reasoning. As a preparation for the study of algebra or generalised arithmetic, the study of the equivalence of the two expressions $9 - (5 - 2)$ and $9 - 5 + 2$ is even more important than the reduction of each to the number 6; but in actual practice little or no stress is laid on such study. It is in the study of simple, easily illustrated cases like this that the pupil can not only become familiar with the importance of *form*, but also grow accustomed to the consideration of general principles. The general laws of arithmetical operations, which are at a later stage made the basis of algebra, can quite well be illustrated in such a way that the pupil will gradually realise that, although he is dealing with particular numbers, he is stating principles, or laws, or rules of operation that are applicable whatever numbers he may take.

Of course, no sensible person will ask that the technical nomenclature for these laws should be used with children, and there must always

be considerable latitude granted to the teacher as to the time when he will discuss such questions. But the discussion is postponed too long if it is only begun when the pupils commence formal algebra. Even such a simple proceeding as the use of a letter to represent a number makes a demand on the power of abstract thinking for which the pupils are not prepared; the use of negative numbers and the deduction (or the *definition*) of the rule of signs and the establishment of the ordinary working rules appeal to the pupils simply as so many more rules which they have to commit to memory, and not at all as the natural extension of principles with which they are already familiar.

One cannot forget that algebra is *generalised* arithmetic, and is therefore comparatively abstract; unless pupils before beginning the study of algebra have been gradually led to appreciate the generality of arithmetical operations and to follow out simple chains of reasoning, it is unreasonable to expect them to do more than apply rules mechanically. The manifold exhortations to use common sense and to refrain from blindly following rules are in fact out of place. To such pupils common sense can only mean that they must follow a rule, and one need not be surprised that amid so many rules the pupils often go astray; the wonder rather is that the blunders are not more frequent.

The blame for the unsatisfactory character of much work in arithmetic and algebra cannot, I think, be fairly attributed to the absence of good text-books. In recent years several excellent text-books on arithmetic and algebra have been put on the market, and if these were properly used there would, I believe, be great improvement in teaching. No text-book can wholly replace the living voice, but neither, in my opinion, can the living voice replace the text-book. However that may be, there is urgent need for the practical rationalisation of arithmetic; the pupils should be regularly trained to put in words the reasons for the equivalence of two sets of operations, illustrating these by concrete examples. Geometrical illustrations can now be given with special facility by means of the ubiquitous squared paper. Practice of this kind would be a relief from the somewhat repellent round of arithmetical calculations, and would gradually develop the capacity of drawing inferences while awakening the notion of general principles. When formal algebra is begun, the pupil will see for himself that he is merely doing arithmetic, and as he advances in his study he will appreciate both the reasonableness and the simplicity of the extensions of arithmetical conceptions.

The teaching of algebra to pupils thus prepared can be much more thorough than is customary at present. The common reference to the laws of combination established in arithmetic will then have a definite meaning, and the formal enunciation of these is quite justifiable on the grounds of "scientific economy." One possibility deserves particular notice; a pupil may now

be expected to understand the rôle of *definition* in algebra. The really vital importance of definition is not, I venture to think, sufficiently emphasised even in good text-books. At bottom the fundamental laws of algebra are really definitions; they form the premises from which the rest of the algebraic theorems are to be derived by a process of logical deduction. The manifold applications of algebra in geometry, mechanics, physics, &c., depend upon the fact that the operands and operative symbols of algebra satisfy the same laws of combination as the magnitudes dealt with in these other sciences. This is, of course, what might be expected when the origin of the fundamental rules of arithmetic is considered; but the generalisation of the rules of arithmetic is deliberately made so as to form a system that will have wide applications, and this generalisation is accomplished by means of suitable definitions. So far as my experience enables me to judge, the great majority of students have the utmost difficulty in appreciating the importance of definitions, and I attribute this difficulty in great measure to the lack of training in the discussion of the meaning of the processes of arithmetic. Even in text-books one frequently finds an argument based on operations that not only have not been defined, but that have been expressly excluded in laying down the fundamental laws. The most frequent case is probably that of division by zero; in fact, zero and infinity fare very badly in the hands of most students, and are a constant source of serious error.

It is, no doubt, quite possible (daily experience proves the possibility) to teach pupils to perform correctly many algebraic transformations and to make use of algebra in various applications without subjecting them to drill in the common-sense principles that underlie all their work; but pupils of this type are specially liable to the blunders that call for comment as violations of common sense. This special liability to error is not an accidental failing that can be remedied by exhortations to remember the rules, or to use common sense; it is rather the accompaniment of a narrow mental outlook, of a habit of working according to stereotyped methods. Such pupils show no flexibility simply because their training cannot develop it; they work by rules of which they have not grasped the meaning, because they have not been trained to go behind the rules and find the reasons on which they are based. Their work is almost wholly mechanical and necessarily so. If, on the other hand, pupils have throughout their arithmetical training been led to see how the various rules are formed, and taught to express the various steps in the working of examples as a succession of intelligible operations, they will not only have the rules at command, but have greatly strengthened their capacity for reasoning correctly. Arithmetic when properly taught is a valuable instrument of mental discipline; if it be taught simply as a system of rules that have to be remembered, it may no doubt develop the memory,

but it will not appreciably call forth the power of clear, logical thinking, and without this faculty the study of algebra is bound to be both difficult and unfruitful.

The most salutary check on the vanity of the teacher who imagines himself to be a skilled expositor of his subject is probably to be found in the examination of papers worked by pupils whom he himself has taught; the facility with which the pupils misinterpret the teacher's favourite devices or conceptions is a constant reminder of the complexity of the problem of mental training. The growth of the faculty of what may be termed abstract thinking is in general exceedingly slow. To the average pupil the p th root of the q th power of x is a mere expression, even when the 5th root of the 4th power of x is a fairly intelligible conception. The Remainder Theorem can often be applied correctly when the meaning of it is hardly at all grasped, and many pupils can solve an equation graphically who are quite unable to justify their method on any general principle. The fundamental difficulty in all such cases is due to the fact that the mind can only grasp the particular and the concrete, not the general and the abstract; a comparatively long training, with exercises of the simplest kind in the earlier stages, is necessary for the acquisition of the power of reasoning about general principles.

If there is any force at all in my contentions it is incumbent on the teacher to keep both aspects of arithmetical work steadily in view: on the one hand, accuracy in the performance of arithmetical operations must still be demanded, but, on the other, the possibilities latent in the study of arithmetic for the development of thinking power must be more fully recognised and translated into practice. That the task is not easy may at once be granted, but that it is hopeless I see no ground whatever for believing. Whether the pupil advances to the study of algebra or not he will receive more benefit from a systematic effort to understand the meaning of the numerous rules of arithmetic and to express arithmetical operations in an intelligible and logical symbolism than from the mechanical exercises that constitute so large a part of present practice. Whatever method of arithmetical training is followed there will always be, so long as human nature is as complex as it now appears to be, a certain proportion of children who will fail to gain more than a moderate command either of the science or of the practice of arithmetic; but it is impossible to accept the position that every practicable system of training will always leave it possible for the majority of children, or even for a large minority of them, to neglect common-sense precautions, or to serve up absurd answers to questions in the way that is so common at present. Any method of teaching that makes it possible for a large number of pupils to make gross blunders without being aware of them (and this is really the charge against present practice) is self-condemned; either the subject is unsuit-

able for children, or else the methods of expounding it are at fault.

It is, of course, possible that the defects of present practice are not so serious as many examiners and teachers believe, but they are undoubtedly serious enough. The types of error referred to in the report mentioned above are certainly frequent; in my judgment they are not to be remedied by any method of selecting some formulæ as necessary to be committed to memory and relegating the rest to a reference table, but can only be effectually kept in check by a training that will enable a pupil to go behind the formulæ and reconstruct them for himself so that he may be less dependent on formulæ and more able to tackle problems in the light of first principles. Such a training, however, must extend over years, and should, in my judgment, be well advanced before the study of formal algebra is begun.

SOME DEFECTS IN THE TEACHING OF HISTORY IN SCHOOLS.

By F. J. C. HEARNSHAW, M.A., LL.M.

Professor of History in the Hartley University College, Southampton.

I.

WE who are engaged in the teaching of history, whether in schools or in colleges, do well to lift our eyes occasionally from the engrossing contemplation of our pupils or our tasks, in order that we may observe that we are being watched by critics who are making a careful and exhaustive study of ourselves and our methods, our teaching and its results. These critics are usually kindly and sympathetic, even if keen and candid. Many of them speak with knowledge and authority. As Edward III. from the serene summit of a windmill beheld the field of Crecy and the Black Prince toiling in fighting, so do they view the narrow sphere of our work—our conflict with ignorance—from a height and a distance sufficient to enable them to regard it as part of the wide field of educational operations as a whole. They are not unwilling to come to our help and assistance when we are in need. Nay, more; they offer us their aid, and we should be churlish and unwise indeed if we were not to accept it with gratitude.

Who are these mentors? From what points of view do they regard us and our labours? First, there are the educational experts, the exponents of the theory of pedagogy, who have opinions as to what history ought to accomplish, if it is properly taught; they criticise comprehensively our aims, our materials, our methods. Secondly, there are the public examining boards, who, in judging the achievements of our pupils and reporting upon them, indirectly judge us and reveal our weaknesses and defects. Thirdly, there are Government and other inspectors—somewhat awfully familiar to those of us who are nurtured by such stern foster-mothers as the Board of

Education or the County Councils—who come to see and hear us teach, and who tell us with a frankness that tends to shake our magisterial dignity what they think of it all. Finally, there are the great teachers of our subject who, from the vantage-ground of their wide experience and knowledge, guide and direct their lowly followers,

What are the general features of the criticisms and suggestions offered by these various authorities? Let one example under each head suffice; for it will be more profitable, I think, later on to throw the judgments all together and then re-group them in order to treat them in some kind of logical classification and order.

1. CRITICISM OF EDUCATIONAL EXPERTS.

In 1897 a skilled educationist, Mr. George L. Fox, came from America in order to study specially the teaching of history in English secondary schools. He was not favourably impressed by what he saw. He quotes in his report,¹ with evident approval, the verdict of Mr. Bryce, that "history is of all subjects which schools attempt to handle perhaps the worst taught"; and adds, with equal agreement, the opinion of Mr. Storr, that "it is generally admitted that the teaching of history is exceedingly bad in our schools." He speaks generally of the "great lack of system and uniformity of method" in the teaching of history in England, and then passes on to enumerate six specific defects commonly noticeable. First, "European history, except where it is in close contact with English history, is not formally and generally recognised in the school curriculum." Secondly, "little attention is paid to the history of Great Britain during the present century, or, to speak more accurately, since the passing of the Reform Bill in 1832." Thirdly, the teaching of civic duty is neglected, and, as Mr. Bryce says, "boys leave our so-called secondary schools . . . having received no regular instruction in the principles and working of the British constitution, much less in their own system of local government." Fourthly, "the time allowance for the regular teaching of history in most English schools shows less consideration for the subject than in France or Germany." Fifthly, specialists have not commonly, until recent years, been employed to teach history, but the subject has been entrusted to any form-master whose time is not otherwise wholly filled up. Finally, "the earnest use of 'sources' with secondary-school pupils is very rare in England." Such are the flaws in English historical teaching which this acute American educationist perceives.

2. CRITICISM OF PUBLIC EXAMINING BOARDS.

Year by year the syndics of the Oxford and the Cambridge Local examinations issue reports covering subject by subject the whole ground of their examinations. Frequently the remarks of those erudite, laborious, and much-to-be-pitied scholars, who—with a courage and endurance ex-

¹ Appendix V. to "The Study of History in Schools." Report of the Committee of Seven. (Macmillan, 1899.)

ceeding that of mediæval flagellants—have read and judged the multitudinous scripts gathered from all parts of the Empire, are full of suggestion for the teachers who have trained the writers of the scripts. Thus in their last report the Oxford examiners complain of (a) a want of accuracy in important dates, (b) a failure to co-ordinate geography with history, and (c) a lack of ability on the part of pupils to "discriminate between the more and the less essential issues." Similarly, the Cambridge examiners in their recent reports have directed attention to such faults as "a general inability to distinguish between important facts and trivial details," an unintelligent use of stock phrases and imperfectly-grasped terms, a failure to perceive causal connections between events, a neglect of historical geography, an ignorance of the constitutional side of history, an increase of "the practice of learning by heart answers to probable questions," and, among older candidates, the existence of "much confusion of thought on economic subjects." In 1896 they were so greatly disheartened that they were constrained to utter the lament: "The results of the examination suggest the conclusion that the subject is regarded very generally as of little importance, and that far too little time is given to its study." A reprint of the general criticisms of these Oxford and Cambridge reports, if the university authorities would allow it to be made, would be very useful to teachers.

3. CRITICISM OF INSPECTORS.

The observations of inspectors are, of course, usually made verbally and personally; they apply primarily to individual teachers, and they are rarely made known to the world. This is a misfortune; for the inspectors employed by the Board of Education and the larger County Councils are, as a rule, men of high attainments and wide educational experience—men, moreover, with a definite policy and clarified ideals. However, occasionally inspectors publish reports and issue memoranda, and from these it is possible to glean much valuable information concerning current methods of historical teaching and some pungent utterances concerning its defects. I have before me as I write two typewritten documents sent out by the Board of Education. They relate, it is true, specially to the teaching of history in training colleges; but that pupils in the middle forms of a secondary school and students in a training college differ in little else than in age is one of the prime truths that more than five years' experience with each has taught me.

The first of these documents treats of the teaching of history; the second deals with the results of a recent examination. In the former, the writer, Dr. Osmund Airy (whose name is well known in the world of history) lays down many suggestive canons for the guidance of the teacher. In opening, he speaks of the use of a text-book. Some teachers discard the text-book altogether; they are unwise: "a good text-book has its place; it serves at least to present a considerable

period in a compassable and connected form; it shows up the necessary landmarks." As to the use of the text-book, it is good for the pupil to read the portion assigned for a lesson *before*, as well as after, it is dealt with in class. As to note-taking, the pupil should be exercised and guided from the first in this most difficult but all-important art: "very few students know how to take notes well; it is one of the most useful of practices." As to the lecture method of instruction, it should be carefully avoided: "it is of the very essence of good teaching . . . that there should be an interchange of voice between teacher and taught," and "it is impossible to insist too strongly upon this partnership" between teacher and pupil, each questioning, each eliciting information from the other. As to written work on the part of the pupil, it should not be omitted altogether, though it should not be excessive in amount; "one of the main weaknesses of students is the failure to realise exactly what they are asked for"; an occasional test-paper will enable a teacher to correct this defect, and will give him an opportunity to suggest improvements in literary style. As to reading supplementary to the text-book, the teacher should stimulate his class to seek it, and should tell them what to read; "monographs upon special periods or subjects, commentaries of various calibres . . . original authorities, and the best historical fiction" should be employed to clothe the dry bones of the text-book outline. Finally, as to the functions of the teacher, it should be his work to make those under his charge realise the humanity of history, the continuity of history, the picturesqueness of history; he should fill them with "the habit of reverence for nobility," and he should quicken their imagination. "When these three senses—the senses of humanity in history, of continuity, of picturesqueness—and when reverence and imagination have been acquired, the student is a historian indeed."

The second of these Board of Education papers deals, as I have said, with the results of a recent examination. It contains three criticisms of the papers under review: (1) "The outstanding defect in the history papers was irrelevance, the constant introduction of information not germane to the question." (2) "The second very serious weakness was the absence of any evidence, with one or two notable exceptions, of independent reading on the part of the students." (3) There were very few indications that "the atlas had been studied side by side with the history."

From these examples it will be seen in what a valuable manner the criticisms of inspectors supplement those of educationists and examiners.

4. CRITICISM OF HISTORIANS.

Several great historians have in recent years expressed opinions concerning the teaching of history in schools. Thus MM. Langlois and Seignobos have in their "Introduction aux Études historiques" a chapter on "L'enseignement secondaire de l'histoire en France." It deals,

however, not so much with methods of teaching as with the end the teacher should have in view. The writers hold that history should be employed, not to inculcate moral lessons, or to inspire patriotism, but simply to serve as "un instrument de culture sociale." M. Lavisson, also, deals with the question in his "À propos de nos Écoles." In England Prof. Firth, of Oxford, is doing a great work for teachers through the Historical Association, of which he is founder and first president. All who are interested in the teaching of history should join this association (sec., Miss Curran, 6, South Square, Gray's Inn, London, W.C.), and should obtain its valuable leaflets. Prof. Firth mentions as among the defects of modern history teaching: (1) the effort to impart too much detail—"the average text-book contains too many facts, and the average teacher tries to be too comprehensive"; (2) the failure to co-ordinate geography with history—"the defect is partly due to the fact that in 'locals' and other examinations which affect the curriculum of a school the geography prescribed has no relation to the history prescribed, so that one study does not reinforce the other; it is also due partly to the fact that few schools have trained teachers of geography"; (3) the failure to co-ordinate English literature with English history.

Such, then, are examples of the various kinds of criticism passed upon teachers of history, their aims, methods, and achievements, by the different classes of authorities. I propose in another article, using these criticisms as a basis, to discuss a constructive policy of reform.

RECENT CONTRIBUTIONS TO THE STUDY OF CHEMICAL CHANGE.

By W. A. DAVIS, B.Sc. (Lond.),

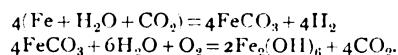
Demonstrator in Chemistry, Central Technical College,
London.

I.—THE RUSTING OF IRON.

THE rusting of iron, which at first sight would appear to be one of the simplest of chemical changes, has recently been the subject of considerable discussion. It may perhaps seem strange that the cause of a phenomenon so generally observed and so destructive in its results should not long ago have been definitely ascertained and a final solution given of so apparently simple a problem. The reason lies in the fact that the rusting of iron is one of those changes which are conditioned by minute traces of impurity. The consideration of recent work with regard to this problem affords a convenient standpoint from which to survey the larger question of the conditions determining chemical action in general. Recent researches appear to have established firmly the principle that between two substances in a state of purity direct interaction is impossible; certain conditions associated with the presence of a third substance have to be fulfilled before action becomes possible. It is

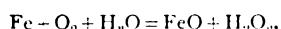
intended in the present series of papers to show why it is necessary to adopt this view in the case of several important changes, such as the rusting of iron and combustion, as well as to indicate how older ideas have been modified or become untenable. Finally, cases will be dealt with in which the influence exerted by traces in determining the interaction of large masses has been applied in industrial operations.

It has long been known that iron, when kept dry, will not rust in the air but that it undergoes corrosion rapidly when exposed to the simultaneous action of air and water. During the greater part of last century rusting was regarded as a simple process of oxidation; no attempt was made to explain the part played by water in the change, although its presence was recognised as essential. It had early been established that water alone would not cause iron to rust. In 1871 the experiments of Crace Calvert showed that the presence of carbon dioxide was an essential factor in rusting, and they were interpreted in 1888 by Prof. Crum Brown, who formulated what is now known as the "carbonic acid theory" of the rusting of iron. It was contended that these experiments showed that the formation of rust was not due to a direct attack of oxygen upon the wet iron but that the carbonic acid present in the air dissolved in the water, forming an acid solution which attacked the iron, producing initially ferrous carbonate or bicarbonate; the carbonate subsequently undergoing oxidation under the influence of atmospheric oxygen, forming ferric hydroxide or rust, carbon dioxide being liberated so as to continue the action. The successive changes were summarised as follows:



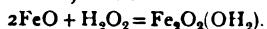
Exactly as much carbon dioxide is liberated in the second equation as is required for the first action to occur, so that when the action is once started it becomes continuous; in fact, a small quantity of carbon dioxide should be able theoretically to convert an infinite quantity of iron into rust. This theory was at the time generally accepted and for several years its substantial correctness was not called into question.

In 1898, however, Prof. Dunstan, director of the scientific department of the Imperial Institute, in a lecture delivered at the Royal Artillery Institution, Woolwich, brought forward another explanation. He considered that his experiments, since published in detail in the *Transactions of the Chemical Society* for October, 1905 (vol. lxxxvii., p. 1548), showed that pure water and pure oxygen, in the absence of carbonic acid, were sufficient to cause iron to rust. Rusting was held to be due to the direct attack of oxygen and water on the metal according to the equation—



ferrous oxide being produced, together with hydrogen peroxide. The latter would imme-

diatey oxidise the ferrous oxide to a hydrated ferric oxide or rust, thus :



This theory was based on the observation originally made by Schönbein and subsequently studied in greater detail by Moritz Traube, that the slow oxidation of several metals, notably zinc and lead, is accompanied by the formation of hydrogen peroxide. It was strengthened by the fact that the slow oxidation or "autoxidation" of many organic substances, such as turpentine and aldehyde, has also been found to give rise to hydrogen peroxide or other peroxides; and additional support appeared to be given to the theory by the fact that a number of substances known to decompose hydrogen peroxide—for example, the alkalis, sodium and potassium carbonate—and the salts of weak acids, such as sodium nitrite and potassium ferrocyanide, were found to prevent iron from rusting when in contact with air and water. Oxidising agents, such as chromic acid, were considered for the same reason to be preventive of rusting.

The need of an explanation of the rusting of iron other than that based on the assumption of

above, twice as much hydrogen peroxide would be produced by the direct action of water and oxygen on iron as is required to oxidise the ferrous oxide completely to rust. Hydrogen peroxide is, moreover, one of the most easily detected of chemical substances, even when only a trace is present. A most minute quantity produces a yellow coloration with a solution of titanic acid; while it has been calculated that 0.0000005 gram molecule of the peroxide can be detected by the blue colour it produces with potassium iodide and starch.

In studying the behaviour of salts in preventing or accelerating rusting, Dr. Gerald T. Moody, of the Central Technical College, came to the conclusion in 1903 (*Proceedings Chem. Soc.*, 1903, pp. 157 and 239) that the influence exerted by certain compounds on the atmospheric rusting of iron depends not on their power of destroying hydrogen peroxide but on their behaviour towards carbon dioxide. Those substances only which combine with, or are decomposed by, carbon dioxide inhibit rusting. Sodium nitrite arrests rusting because it is decomposed by carbon dioxide, giving sodium carbonate and nitrous

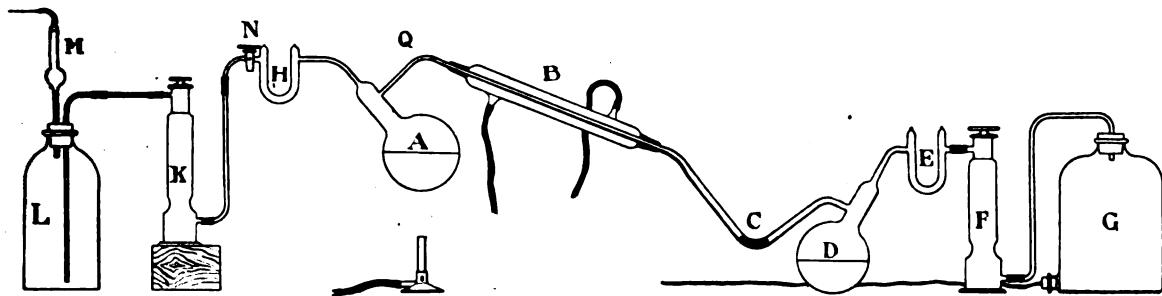


FIG. 1.—Apparatus to show that iron does not rust in the absence of carbon dioxide.

the activity of carbonic acid really turns on the question whether pure oxygen and water alone are able to rust iron. Prof. Dunstan considered that in his experiments he had succeeded in absolutely excluding carbon dioxide and contended that the older theory of rusting was "quite untenable, since it has been shown that rusting can take place in the absence of carbonic acid." In the ordinary atmospheric corrosion of iron the part played by carbonic acid was held to be "subsidiary and not essential." Several analyses were cited to show that ordinary rust contains only a small proportion of carbonic acid and that its composition approximates to that required by the formula $\text{Fe}_2\text{O}_3(\text{OH})_2$; "it is an interesting coincidence, if nothing more, that a substance of this formula would be formed by the union of two molecules of ferrous oxide with one of hydrogen peroxide."

It is, however, of great significance that whilst in the slow oxidation of zinc and lead under certain conditions the formation of hydrogen peroxide can easily be recognised, not a trace of hydrogen peroxide can be detected during the rusting of iron. This is the more remarkable inasmuch as, according to the equations given

acid; potassium ferrocyanide similarly absorbs carbon dioxide, evolving hydrogen cyanide and becoming alkaline. Potassium iodide, on the other hand, which instantly decomposes hydrogen peroxide, does not arrest but actually accelerates rusting. Pure hydrogen peroxide, moreover, when free from every trace of acid, was found not to cause iron to rust.

In the light of these results, which cannot be reconciled with the hydrogen peroxide theory of rusting, it became necessary to ascertain whether, in the experiments which were relied on as proving that oxygen and water alone were sufficient to rust iron, every trace of carbon dioxide had been excluded. In a series of carefully conducted experiments, described in the *Transactions of the Chemical Society* for April, 1906 (vol. lxxxix., p. 720), Dr. Moody was able to show that although it is extremely difficult entirely to remove carbon dioxide, when very special precautions are taken to eliminate this substance iron may be left in contact with pure oxygen and pure water for many weeks without undergoing change. After several unsuccessful attempts to exclude carbon dioxide, the apparatus illustrated in Fig. 1 was ultimately found to be satis-

factory. A small rod of pure iron is placed in the bend, c, of a piece of glass tube which passes through the condenser case, b, and is sealed to the side tube of the distilling flask, a. The flask d, acting as a receiver, is connected as shown with the large aspirator, e, by means of the U-tube, f, containing soda-lime, and the tower of caustic potash, g. The air reservoir, h, containing sticks of moistened caustic potash, is joined to a soda-lime tube, i, and the caustic potash tower, k. When the aspirator, e, is in action, air enters the apparatus through the minute orifice at the upper part of the tube, m, which is filled with soda-lime. As all the essential parts of the apparatus are fused together, leakage of carbon dioxide from the air into bend c is entirely prevented when reasonable precautions are taken. Where india-rubber connections are necessary in the apparatus, pressure tubing is used, securely wired on and with its surface covered with vaseline. In making an actual experiment, the piece of polished iron in the form of a cylinder was placed in the bent glass tube with sufficient of a 1 per cent. solution of chromic acid just to cover it. Air was then slowly drawn through the apparatus during about three weeks, so as to remove any trace of carbon dioxide from contact with the iron. Water was then distilled from the flask, a, containing a 1 per cent. solution of baryta, until all the chromic acid was washed into the receiver d. Air was then gradually admitted and drawn through the apparatus during about six weeks.

Working in this way, it was found in one experiment that thirty times the quantity of oxygen necessary to convert the whole of the iron into oxide was passed through the apparatus without even a speck of rust becoming visible. That the preliminary treatment of the iron with chromic acid had in no way rendered it unsusceptible to rusting was shown by removing the scrubbing arrangement by which the air was freed from carbon dioxide, so as to permit of the ingress of this gas with the air; rusting was seen to begin immediately; in seventy-two hours the whole of the surface of the metal was corroded and a considerable quantity of red rust had settled in the bottom of the bend.

It must therefore be considered as established beyond doubt that, in the absence of traces of carbon dioxide, pure oxygen and water will not attack iron. Essentially the action is one of attack by acid. A trace of any acid will initiate the process but rusting appears to occur most rapidly when the acid is carbonic acid; this is owing to the fact that ferrous carbonate is easily oxidised to ferric hydroxide, the whole of the carbonic acid being liberated, so that it is available again to attack the iron. That carbonic acid is the principal agent in ordinary atmospheric rusting is shown also by analyses of iron rust in the course of formation. Such rust contains a large proportion of ferrous carbonate but when it is exposed to the air during about a week it rapidly

undergoes oxidation, losing carbon dioxide and being converted into a hydrated ferric oxide.

So long as pure iron is in contact only with pure oxygen and water the conditions which determine chemical change remain unfulfilled. In order that chemical change may take place between any two substances, it appears essential that a potential difference should exist between these substances whilst an electrolyte is present which enables an electric circuit to be formed. To illustrate this action, the case of zinc dissolving in dilute sulphuric acid may be considered; when the metal is impure it dissolves rapidly in the acid but as the zinc is more and more purified it dissolves with increasing difficulty, until ultimately a very highly purified metal hardly dissolves at all. Directly, however, a piece of copper is placed in the acid and in contact with the zinc, the latter dissolves rapidly and an electric current is generated, hydrogen being evolved at the copper and not at the zinc. In the case of ordinary commercial zinc, a number of tiny electric cells are formed between the particles of zinc and the particles of impurity, such as carbon, lead, and iron; the hydrogen liberated during the dissolution of such commercial metal must be considered as evolved, as in a simple galvanic cell, not from the surface of the zinc but from the particles of the impurity acting as positive poles.

To sum up: pure water is a non-electrolyte; in presence of a trace of acid, such as carbonic acid, however, the water becomes conducting and an electric circuit is formed between it and the iron; consequently the metal dissolves, giving a solution of a ferrous salt which undergoes more or less rapid oxidation—ultimately to form rust. The trace of impurity in the water initiates the action. In a subsequent article reasons will be given for considering that the presence of a similar "impurity" is also determinative of the complex changes which occur when a candle burns or when a piece of coal is kindled.

"BRADSHAW" AS A CLASS TEXT-BOOK.

By ALBERT G. LINNEY,
Ackworth School, Pontefract.

"Romance!" the season-tickets mourn,
"He never ran to catch his train,
But passed with coach and guard and horn—
And left the local—late again!"
Confound Romance! . . . And all unseen
Romance brought up the nine-fifteen.

SO sings Mr. Kipling: the Romance of the Iron Road is real to-day, and the schoolboy can recognise it for himself almost as soon as the grown-up. Real, tangible, seeable things interest a child at once, and there is more joy in the heart of the youngster over one flint axe-head put into his hand to feel than over ninety and nine perorations on Magna Charta.

Thus in geography. The train brings him to school, the train takes him home again, and the

train bears him to the seaside for his holidays. Last year he went down to Edinburgh in the " Flying Scotchman " to see his uncle, and the other week his father wrote that he had been with the " Irishman " to Holyhead. And so, when you tell the boy that the term's course in geography is going to deal with British railways, and that " Bradshaw " is going to be the textbook, he pricks up his ears at once, and feels that he is in touch with his work already.

Mr. Le Queux and the other gentlemen who supply the public with horrific tales of German invasions of England show us that the conquerors do not, as their forerunners used to do, follow from the coast up the river-valleys. No; it is the railroad which is the important thing. Commerce in the twentieth century has its marts where rail communication is best—for the most part. These are reasons, then, why there is educational value to be got out of geography teaching on the lines which I have hinted at and propose to develop.

SOME PRACTICAL POINTS FOR TEACHERS.—Any good modern geography text-book will give sufficient information in condensed form for a working basis when preparing for the course. As a reference map, to place upon the wall if need be, there is a very comprehensive map issued by the *Railway Magazine* (30, Fetter Lane, E.C.); for use, to display in front of a class, I found it helpful to make an outline map of England on the largest sheet of white paper I could obtain. Then, as we dealt with the lines one by one—beginning, for instance, with the East Coast, West Coast, and Midland routes to Scotland—it was convenient to mark in these main lines in different colours. At the end, say, of one or two lessons all that this map contained were the three London to Scotland routes, standing out clear to the eye, no names being inserted.

Then might follow the two routes to the West Country by the Great Western and the London and South-Western; next the lines joining London with Dover, Folkestone, and Newhaven, the three most important cross-Channel starting-points; and so on.

Messrs. Cassell and Co., Ltd., publish a capital series of " Guides " to the chief lines; each volume contains a map of the system, many illustrations of the principal points of interest, information as to the trade of the districts passed through, and the cost of each volume is only a shilling. This series may very well be placed in a case in the class-room, so that the pupils can consult the books for themselves. If circumstances permit, the current issues of the *Railway Magazine* are suitable to be added to the book-case. Nor should we forget to utilise the ubiquitous picture postcard: there is at least one set illustrating types of the engines used by the great companies, and the postcard board will seldom be without spectators.

THE POSTER IN TEACHING.—Through the eye to the brain is one of the cardinal maxims for the teacher as well as for the advertiser. I have

always found the headquarters officials of the big railway companies ready to forward a batch of their best posters and their most useful handbooks to schoolmasters who wrote and explained why they wanted them. The walls of the class-room will blare colour when your posters are up, but the schoolboy's artistic senses will not be fatally ruined at worst, and he will remember those posters.

To many folks of mature years, a " Bradshaw " is a fearsome thing, and it may remain a mystery to the pupil if he takes up its 1,200 pages and tries to " get the hang of the thing " without a few words of general guidance first. Then, so soon as the build of the book, if one may use the term, has been somewhat explained, the schoolboy will find out a good deal by poking about for himself. A word or two, then, as to the general fashioning of the class text-book. There is, first of all, a folder map at the beginning of the book; a glance thereat shows a perfect maze of figures and names which are calculated to appal until the supremely important sentence printed at each side of the map is read: " The figures on the map refer to the pages in the Guide where the Train Services are shown." It is on this map, with its illuminating figures, that the pupil should be taught to rely when he comes to tackle " problems."

On the back of the map appears a very useful decagon-shaped figure indicating the chief lines which possess London termini, and the pages of " Bradshaw " in which the train service of those lines is contained are shown just inside the inner edge of the decagon.

THE MYSTERY OF " BRADSHAW " disappears to some extent when the ideas embodied in the map, the decagon pattern arrangement, and the inner title-page (showing main lines, down and up) are grasped. Pages 1 to 900 (about) then set forth the train arrangements in detail; a series of steamboat advertisements occupies some fifty pages; and then follows—about page 940—an alphabetical steamer-sailing list. This is useful to refer to later, when problems may be set involving train connections to catch steamer services to the near Continental capitals or further afield.

Now as to the actual scheme of class lessons. As already suggested, it is well to begin by dealing with London to Scotland routes, working at the outline maps as we proceed; the pages showing chief towns on those routes are referred to easily, and the teacher can throw out questions as he goes along to find out from his pupils the nature of the *goods traffic* likely to come from each town and district. Perhaps I should here say that the initial lesson of all may deal in crisp fashion with the historical development of inland communication and railway extension. The order in which the teacher takes the chief lines from this point is largely a matter for his own judgment, and may depend a little upon the locality of the school. After the first introduction to the " Bradshaw " text-book,

and when, for instance, the London to Scotland routes have been dealt with, a simple problem may be set for the pupils to work in their evening preparation. For example:

"Two men are going to Edinburgh from London. One leaves Euston at 10 a.m., the other leaves King's Cross at 10.10. Set out their respective time-tables, and say which man reaches his destination first."

Here is a model answer:

	Page	Stop	Time	Line
West Coast Route	384	Euston	10.	L. and N. W. Ry.
	384	Rugby	11.32	
			dep. 11.35	
	385	Crewe	12.59	
			dep. 1.7	
	385	Carlisle	3.48	
East Coast Route	822		dep. 3.50	C. Ry.
	822	Edinbro' (Princes St.)	6.15	
	320	King's Cross	10.10	G. N. Ry.
		Grantham	12.10	
			dep. 12.15	
	321	York	1.53	
	612		dep. 2.3	N. E. Ry.
	613	Newcastle	3.40	and
			dep. 3.48	N. B. Ry.
	767	Edinbro' (Waverley)	6.25	

Ans. The passenger via West Coast Route reaches Edinburgh ten minutes before the other.

The page references follow on to one another from the left-hand column. For example, page 385 shows detailed train run from Euston to Crewe; at foot of this page, alongside the name Carlisle, appear the figures 450, 800, 820. Page 450 substantiates page 385, giving way stations between Wigan and Carlisle; page 800 shows Glasgow and South-Western trains from Carlisle to Glasgow; while 820 sets forth the Caledonian Railway main line, and page 823 indicates the train in question. These cross-reference figures are the guides enabling the pupil to work on from one stage to the next, and I have shown how these are used in working out the actual problem propounded.

Sometimes I have asked the class to state approximate fares for these long main-line runs; this can be done, because the narrow left-hand column shows mileage from end to end. Third-class fare may be counted at a penny a mile.

RAILWAYS AND REALITY.—This is a fairly straightforward problem, but one, nevertheless, which needs a clear head and some power of following up an idea. Evidently it is one which serves to strengthen and bring out the power of reasoning, and therefore, in its way, is fulfilling just that office which geometrical exercises and algebra problems are meant to fulfil. The average schoolboy tackles such a puzzle with more zest than a mathematical one, because it is a *real thing not a great way off his outward life*. At best he is not burningly interested in a state-

ment beginning "Thirty-eight years ago X was fourteen years younger than his father," and ending up, "find the age of each." It may excite a casual interest in him to attempt to show that the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides. But *enfin*?

A friend of the writer, when beginning a "Bradshaw" course, asked casually if anyone in his class had any picture postcards of locomotives. Forty were forthcoming at once, or one per head of the pupils. Even in these superior days the schoolboy does not despise such material items as food and drink; wherefore the introduction into a "Bradshaw" problem of such a subtle lure as "Arrange for the journey to be done so that the passenger can get his meals on board the train, or shall have time to get them at stations *en route*," is not one to be altogether neglected. I have known (not once or twice, but pretty often) a boy, to whom Euclid was an abomination, and algebra a thing of loathing, get up early so as to hammer at a "Bradshaw" question. And this was not for love of marks, but because his desire was to triumph over the stumbling-block which faced him.

THE VALUE OF IT ALL.—The geography of the British Isles can undoubtedly be taught in this fashion as a practical matter. But the greatest value of the system which I am endeavouring to explain is this—it tends to bring out the *reasoning faculties* of the pupils, and especially those of the non-mathematically inclined. It is work which eminently is worth something for those whose reasoning powers are not touched or drawn out by the acknowledged means through which we seek to foster them. I have heard an educationist say, "*Science classes are apt to evaporate in mere interest.*" My experience has been that this fashion of teaching geography has not resulted in the mere awakening of interest and of nothing more.

I should say, in conclusion, that the idea of this method of teaching is not my own. To the best of my knowledge, it was originated by my colleague at Bootham School, York, Mr. O. B. Baynes, and was carried on there with marked success by Mr. E. B. Collinson.

PARAPHRASING IN PRACTICE.

By NORMAN L. FRAZER, M.A.
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I.

THREE will be no attempt in the present articles to defend the practice of paraphrasing. The writer's task is far humbler; he has merely to consider the difficulties of this exercise and to suggest workaday methods of instruction. Those teachers who have doubts as to the efficacy of paraphrasing as an instrument for fashioning literary discernment and appreciation are invited to read the article which Mr. J. H. Fowler contributed to THE SCHOOL

WORLD for February, 1906. He discussed general principles; I limit myself to the actual conditions of class-room exigencies. For although some are able to choose their methods of teaching English, there are others who are tied down by the regulations of examinations which demand this particular mode. That some difficulty has been experienced by this latter class of teachers is quite evident from the recently published reports of the examiners for the Oxford Local examinations. In the case of preliminary, junior, and senior candidates, they had the same complaint to make. They found in the preliminary grade that "the weak spot in the answers on the book of Scott was usually the paraphrasing, in which both composition and punctuation left much to be desired"; in the junior grade, that "in composition, the greater number of candidates appear to have found considerable difficulty in doing the paraphrase"; and lastly, in the senior grade, that "the paraphrasing of Wordsworth's sonnet proved too hard for the vast majority of the candidates; most of them grasped the general idea without understanding the significance of the individual phrases. . . . Others appear to have no idea of what is meant by a paraphrase." After such a report no further apology seems needed for the present articles.

It is probable that the reason of the general failure here exposed is to be found precisely in this last sentence we have quoted: that many "have no idea of what is meant by a paraphrase." For our own part we do not think that it could be defined and explained more ably or concisely than in the words of Mr. H. C. Bowen.¹ "Paraphrasing," he says, "is the unpacking and exhibiting clearly and at large of the whole meaning of a passage, which in the author in question is expressed in a brief and condensed or figurative form, or perhaps at times rather suggested than expressed. It requires in the pupil a knowledge of the real force of the allusions, and of the bearing of the passage as a whole on its context, and the occasion on which it is used. It requires an appreciation of the exact force and intention of the metaphors, similes, and epithets, and a consciousness of that associated meaning or colour which certain words or phrases acquire, and which are brought out most distinctly in the contrasts between so-called synonyms." So strongly do we feel that herein lies the whole meaning of paraphrasing that the whole of our ensuing remarks will be but a commentary on this text, and an endeavour to suggest a continuous course by which, in the senior stage, a pupil shall come within measurable distance of this high ideal.

In the preliminary stage—if we may retain a conventional and fairly convenient differentiation—the difficulties will probably be found rather in the general elements of composition than in the exactness of paraphrase. This was evidently the case in the examiners' report from which we have quoted; and we find it very difficult, therefore, not

to transgress our immediate limits in this stage. To begin with, it would seem that these young pupils must first be taught to reproduce the general sense of a passage in plain language; the oral reproduction of a prose anecdote or a verse fable will provide a useful exercise in elementary punctuation, while the elucidation of the general idea must necessarily precede the consideration of the particular phrase. For this preparatory work it will be found best to begin by reading and studying the selected passage in class, and then to proceed to passages which have not been so read and studied. Even then there is something to be done before tackling a paraphrase. It is to render narrative or romantic verse into prose order, the chief advantage from such an exercise being that the charm of vocabulary is retained, and the essential beauty and need of the original made apparent.

When at last the preliminary pupil is required to make a real paraphrase, there may arise in the teacher's mind a doubt as to whether so formal an exercise is to be divorced from the ordinary literature being read or not. The question was fully and fairly considered by Mr. Fowler in the article to which we have already referred; the only remark that need be made here is that in a rational course the difficulty should hardly arise in this stage at any rate, seeing that the content of the literature read will hardly be of that sacred fineness which tampering profanes. For what will a boy of this age be reading? At the best, that poetry of which Scott, Longfellow, and Macaulay are types. From the point of view of his development in the art of paraphrase, why should these be his types? Because by reading them he will best and most easily make the acquaintance of the stereotyped phraseology of our poetic diction, and get the first glimpses of that association of phrase which is so important a part of literary culture. More than this, he will have taken the first step into that land of classical allusion, outside which appreciation of our greatest literature is hardly possible. With the simplicity of construction and vocabulary suited to the telling of a tale, it will be easy to analyse, to grasp the felicity of a simile, and to distinguish it from a metaphor, and to note the significance of epithets.

Our preference for such authors and the subsequent advantages to be derived from reading them at this stage may be aptly illustrated by taking a question set in the Cambridge Local preliminary paper of 1905.

(a) Explain the following allusions:

"Arthur's slow wain." "My neck-verse at Hairibee."
"Triumphant Michael . . . trampled the Apostate's pride."

(b) Give the meanings of the following words:

Ban-dog, barbican, fleur-de-lys, chancel, gramarye, cresset.

Now, although we are sure that any examiner could have chosen even better instances from the "Lay of the Last Minstrel" to have shown the value of such reading as an introduction to

¹ "English Literature Teaching in Schools," p. 32.

the art of paraphrase, yet here, in this extremely limited space, are to be seen the words and phrases which are among the current coin of our literature. But, after all, the question we have cited was not intended as a test of paraphrasing. From the same paper, however, we take a question which we think a reasonable type of what should be expected at this stage.

Give in simple prose the sense of this passage :

The Ladye sought the lofty hall,
Where many a bold retainer lay,
And, with jocund din, among them all,
Her son pursued his infant play.
A fancied moss-trooper, the boy
The truncheon of a spear bestrode,
And round the hall, right merrily
In mimic foray rode.

Now, what was it that the examiners expected from the candidates to whom this passage was set? If we mistake not, they desired, above all, a plain, straightforward piece of prose which should make the sense even more plain than in the original; they desired correctness in elementary notions of punctuation, and at least the proper distinction between the comma and the full stop. But were it not for their report, it might have been thought that so much would have been secured as a matter of course, and that the outstanding difficulties of the piece to preliminary candidates would have been the retention of the essential idea conveyed by the epithets and the approximation of synonym in the case of one or two nouns. We fear, indeed, that one of the chief causes of failure at this stage lies in the fact that in reading such a passage a young pupil intuitively seizes the general sense, and that his teacher, from his more mature point of view, is hardly able to realise the necessity for that further study which will elucidate the special meaning of every word. We would suggest, therefore, that special exercises are needed to bring out by careful comparison the exact differences of meaning in so-called synonyms, as well as definite illustrations of the meanings of such semi-literary words as *din* and *foray*.

How excellent an author Scott is for elementary practice in paraphrasing, and how he lends himself to the treatment suggested, is shown even better by the following questions taken from the same stage of the same examination for the preceding year:

(1) *Give the meanings of the following words :*

Donion, falchion, palmer, pardoner, pavillion, portcullis, scutcheon, sewer.

(2) *Explain the following sentences :*

- (a) Scantly Lord Marmion's ear could brook
The harper's barbarous lay.
- (b) He shall shrieve penitent no more.
- (c) Betwixt the baron and his host
No point of courtesy was lost.
- (d) Great events were on the gale.
- (e) No hope of gilded spurs to-day.
- (f) Shake not the dying sinner's sand.

- (3) *Give in simple prose the sense of the following lines :*
- The warriors on the turrets high,
Moving athwart the evening sky
Seem'd forms of giant height :
Their armour, as it caught the rays,
Flash'd back again the western blaze,
In lines of dazzling light.

We will now indicate from the authors we have mentioned types of exercises which in our opinion will be found a useful training in the art of paraphrase, suitable for preliminary candidates :

- (1) Make a list of similes drawn from the author's observation of outdoor life.
- (2) Discuss the suitability of the following expressions from Longfellow :
 - (i) The bivouac of life.
 - (ii) The sands of time.
 - (iii) The belfry of his brain.
 - (iv) Whose feet are shod with silence.
 - (v) The corridors of Time.
- (3) Comment upon Macaulay's use of epithets in the "Lays."
- (4) Tell in your own words the story of
 - (a) The wreck of the *Hesperus*.
 - (b) The battle of Lake Regillus.
 - (c) The Combat (in the "Lady of the Lake").
- (5) Explain the following allusions: e.g., classical allusions from the "Lays."
- (6) Give three examples of metaphor from the "Lord of the Isles," and show their appropriateness.

We will conclude this article by giving a few examples of suitable passages for paraphrase proper, so graded in difficulty that the easiest will ensure the need of stating the general sense in properly punctuated prose, while the most difficult will demand some elementary notions of the value of epithets, the appropriateness of imagery, and the most familiar classical allusions. In our next article we will take a step further and consider the requirements of the junior candidate.

(1) *Give in simple prose the sense of the following lines :*

His hair is crisp, and black, and long,
His face is like the tan ;
His brow is wet with honest sweat,
He earns whate'er he can,
And looks the whole world in the face,
For he owes not any man.

(2) *Reproduce in your own words :*

But jaded horsemen, from the west,
At evening to the Castle press'd ;
And busy talkers said they bore
Tidings of fight on Katrine's shore ;
At noon the deadly fray begun,
And lasted till the set of sun,
Thus giddy rumour shook the town,
Till closed the Night her pennons brown.

- (3) *Reproduce the sense of the following passage :*
- Riches and lands, and power, and state—ye have them :
keep them still.
Still keep the holy fillets ; still keep the purple gown,
The axes, and the curule chair, the car, and laurel crown :
Still press us for your cohorts, and, when the fight is done,
Still fill your garners from the soil which our good swords
have won.

Still like a spreading ulcer, which leech-craft may not cure,
Let your foul usance eat away the substance of the poor.

(4) Give the exact sense of the following in your own words:

He did not feel the driver's whip,
Nor the burning heat of day;
For death had illuminated the Land of Sleep,
And his lifeless body lay
A worn-out fetter, that the soul
Had broken and thrown away.

THE STUDY OF THE LIVING PLANT.

SIMPLE EXPERIMENTS FOR "PRELIMINARY CERTIFICATE" STUDENTS.

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I.

THE syllabus for the Preliminary Examination for the Elementary School Teachers' Certificate, 1908, contains a satisfactory regulation to the effect that no candidate will be allowed to take elementary science who does not present a certificate of having had at least thirty hours of systematic practical work. Of the two alternative syllabuses in science, the second is concerned with the study of plant life, and at its head we find the further significant statement that "the purpose of the examination will be to give an opportunity to the student to show the knowledge he has acquired, by his own observational work, of the dependence of any living thing upon its surroundings."

A study of the syllabus shows that it affords scope for practical work of a highly valuable character, and without the use of any expensive apparatus.

In the present and two following articles a course of suitable experiments and observations will be outlined, in the hope that it will furnish useful guidance to teachers preparing candidates for the examination in question.

It may be pointed out that successful work in practical botany is almost impossible unless the habit of making careful drawings and precise descriptions is insisted upon from the first. The drawings should be outline sketches to scale, made with a rather hard pencil in a book kept exclusively for the purpose.

THE GROWTH OF A PLANT TO MATURITY.

THE SEED.—Soak a number of broad-bean seeds in water for a few days. Note the increase in size caused by the absorption of water. Compare the absorption (by capillarity) of water by pieces of blotting-paper, cloth, starch, &c., which have one corner dipping into water.

Examine the soaked seeds (Fig. 1), making out the black stalk-scar, along one edge, and a minute hole (*micropyle*) at one end of the scar. The hole is revealed by the drop of water which ex-

udes from it when the soaked seed is squeezed. Strip off the seed-coat, noting (a) the peg-like *radicle*, with its point (*apex*) directed towards the micropyle; (b) the *plumule*, a continuation of the radicle and lying between (c) the two fleshy cotyledons (Fig. 2). Scrape the surface of a

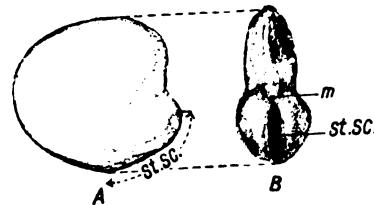


FIG. 1.—A broad-bean seed. A, side view; B, edge view; st.sc., stalk-scar; m, micropyle. (x 3.)

cotyledon, and apply a drop of iodine solution. The blue colour shows the presence of starch.

Remove the seeds from a number of sycamore fruits (Fig. 3). Soak them in water for a day, and then carefully unfold the contents of the seed-coat. Notice, in the position of the cotyledons of the bean (*i.e.*, at the top of the radicle), two green leaves—evidence that the bean cotyledons also are seed-leaves, disguised by the accumulation in them of starch and other stored food. Leaves, however disguised, which are already present in the seed, are called cotyledons. Plants, like the bean and sycamore, the seeds of which contain two cotyledons, are called dicotyledons.

Examine in the same way seeds of lupin and vegetable marrow.

GERMINATION OF SEEDS.—Plant soaked seeds of broad bean, lupin, and vegetable marrow in damp sawdust, keep them warm, and examine at intervals of a few days. Line a tumbler with blotting-paper, put water in the tumbler to the depth of

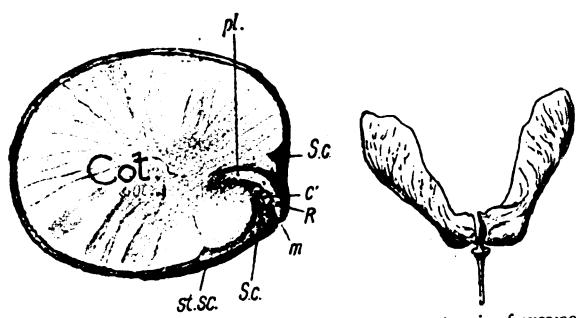


FIG. 2.—Broad-bean seed, seen from the inside, after the removal of half the seed-coat and one cotyledon. Cot., the inner face of remaining cotyledon; C, area of attachment of other cotyledon; m, micropyle; pl., plumule; R, radicle; Sc., seed-coat; st.sc., stalk-scar. (x 1.)

FIG. 3.—A pair of sycamore fruits. (x 3.)

an inch, and drop between the glass and the blotting-paper (kept wet by capillarity) a number of mustard seeds. The seeds should be well above the actual surface of the water. Keep in a warm place, and take care that the bottom of the blotting-paper is always in water.

Observe the growth, vertically downwards, of the radicle of all the seeds; then later (why later?), the emergence and upward growth of the plumule, and (in the case of all except broad-bean seeds) the withdrawal of the cotyledons and their obviously leaf-like character (Figs. 4 to 8). Notice

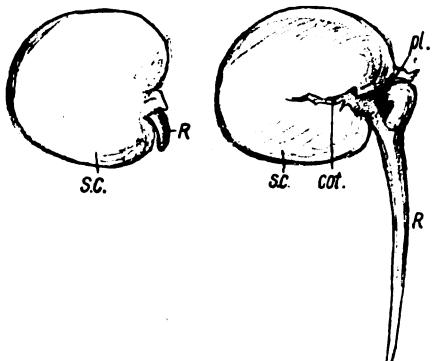


FIG. 4.—An early stage in the germination of a broad-bean seed. *R.*, radicle; *s.c.*, seed-coat. ($\times \frac{3}{4}$)

FIG. 5.—A slightly later stage in the germination of a broad-bean seed. *cot.*, cotyledon; *pl.*, plumule; *s.c.*, seed-coat. ($\times \frac{3}{4}$)

the hook-like appearance of the bean plumule before it gets above ground. What is the advantage of the hook?

On the mustard radicles (Fig. 8), observe the fine, white, fluffy root-hairs. They are present on the other radicles as well, but may be spoiled by being pulled out of the sawdust.

As the bean seedlings grow in size, notice the shrivelling up of the cotyledons, still below ground and enclosed in the seed-coat. In all cases notice the development of the plumule into the young stem of the seedling, and that of the radicle into the young root. Both stem and root presently



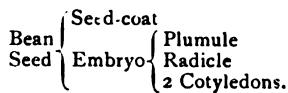
FIG. 6.—Three stages in the growth of the yellow lupin. On the right the cotyledons are still enclosed in the mottled seed-coat. In the middle plant the cotyledons are spreading out; the first foliage leaves have not yet unfolded. On the left, the first two foliage leaves are unfolding, and the cotyledons have spread out flat. (Slightly reduced.)

branch, and the stem bears "foliage" leaves of shape differing from that of the cotyledons (Fig. 6).

Tabulate the differences between the seedling bean plant and the bean seed.

It will be seen that the main regions of the future plant are already to be recognised even

in the seed. The young plant in the seed is called the *embryo*. It consists of plumule (young stem), radicle (young root), and cotyledons (first leaves).



WORK DONE IN GERMINATION.—Note that each seedling overcomes resistance in bursting the seed-coat, overcomes friction in the growth of its root and rootlets through the soil, and overcomes gravitation in raising its plumule (and often cotyledons) well above the level at which the seed was planted. What is the source of the energy giving it the power of doing this work? The energy of a steam-engine comes from the burning (oxidation) of the fuel in the boiler-fire. Is there any evidence of burning, or oxidation, in germinating seeds?

Keep small seeds warm and moist until they begin to germinate, then half-fill a bottle with them. Fit the bottle with a tight cork through which passes (tightly) a thermometer, so arranged that when the cork is in position the bulb of the thermometer is buried in the seeds. Keep the bottle for a few days in a uniformly warm place,

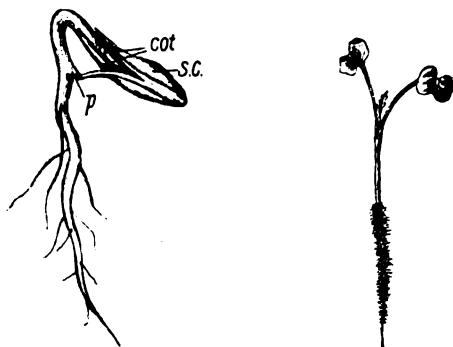


FIG. 7.—Germinating vegetable marrow seed. *p*, the peg by which the seed-coat (*s.c.*) is held down to allow the cotyledons (*cot.*) to be withdrawn. ($\times 1$.) (After Bailey.)

FIG. 8.—Mustard seedling, showing root-hairs and cotyledons. ($\times \frac{1}{2}$)

and compare the thermometer in the bottle with one just outside. The seeds are warmer than their surroundings.

Take out the cork after a few days, and at once plunge in a lighted taper. The flame is extinguished, showing that not enough oxygen for combustion is present. Plunge another lighted taper into a bottle of similar size and shape, but in which no seeds have been kept, and compare the result. Pour off some of the gas (remaining in another bottle of seeds) into a test-tube containing a little clear lime-water, and shake the tube. A milkiness indicates the presence of carbon dioxide. The absorption of oxygen, evolution of carbon dioxide, and liberation of heat are evidence that slow burning (oxidation) is taking place in the seeds.

Compare these changes, wrought in air by germinating seeds, with the similar changes

wrought by animals. Show that the air breathed out from the human lungs is warmer, moister, and contains less oxygen and more carbon dioxide than the surrounding air. What is evidently the source of the energy displayed by animals?

THE CONDITIONS OF GERMINATION.—Make experiments to find what conditions are required to awaken seeds into growth.

(a) *Water*.—Keep seeds dry, but warm and exposed to the air. The seeds do not germinate.

(b) *Air*.—Pack soaked seeds closely with wet clay to exclude air from them, but keep them warm. They do not germinate.

(c) *Temperature*.—Plant various seeds in loose, damp earth in the garden in winter, and take the temperature of the adjacent soil at intervals by pushing in a thermometer. Plant similar seeds in spring and summer, and make notes of any relationship observed between the temperature of the soil and the time required for germination, specifying the kind of seed used in each case. In spring, compare the soil-temperatures on the two sides of a hedge, and notice on which side the young plants come up most freely. A hedge running east and west will yield the most striking results. Also take regular thermometer-readings

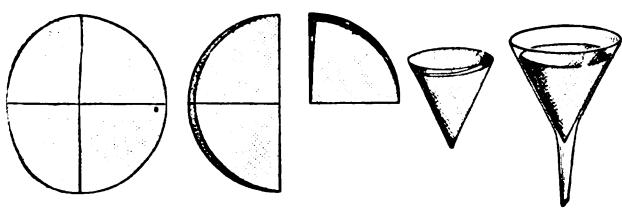


FIG. 9.—How to use a roundpiece of blotting-paper for filtering.

at the top and bottom of a slope, &c., and try to discover if a difference of temperature affects (i) the date of first appearance of spring plants, (ii) the abundance of certain plants.

Make a list of the principal conditions thus seen to be necessary for germination.

FOOD STORED IN SEEDS.—Cut open soaked seeds of bean, pea, lupin, vegetable marrow, mustard, sycamore, and grains of maize, wheat, and barley, and test them with iodine solution. Make a list of those in which the production of a blue colour shows the presence of starch. Make another list of seeds which, although they appear to contain stored food, show no starch.

THE PROPERTIES OF STARCH.—(a) Stir up laundry starch with cold water and filter it carefully (Fig. 9). Test the liquid which passes through the filter-paper, by means of iodine solution, and show that starch is absent. Starch is, therefore, insoluble in cold water.

(b) Rub up with water as much starch as will lie on a shilling, so as to form a thin cream, and then pour on it a cupful of boiling water. The starch swells up, and much of it dissolves in the water. Add a few drops of the starch solution to about half a pint of cold water, and test it

by adding a little iodine solution. Starch is somewhat soluble in boiling water.

THE DIGESTION OF STARCH.—Take a dozen barley seedlings, with roots about an inch long, and pound them up with a little lukewarm water. Filter off the solution, add a few drops of it to a few drops of the weak starch solution obtained in the last experiment, and keep the mixture lukewarm for five minutes. Then test with iodine solution. No starch can be detected.

(b) Add half a teaspoonful of saliva to as much weak starch solution, and keep the mixture lukewarm for five minutes. Test as before; no starch can be detected.

In each case the starch has been digested by being changed into a kind of sugar. The materials in the barley-extract and the saliva respectively, which changed the starch into sugar, are called ferment. The stored starch in seeds must in every case be digested by a ferment before the growing plant can use it as food. Chew a germinating pea, and notice the sweet taste, due to the sugar which has formed in it.

THE PROPERTIES OF ALBUMIN.—Beans and many other seeds contain stored food very similar to albumin or white of egg. Examine the white of a raw egg. Stir it up with water. It dissolves. Stir up with water a little of the stiffened white of a boiled egg. It is insoluble.

THE DIGESTION OF ALBUMIN.—To a cupful of water add twenty drops of strong hydrochloric acid. Stir, and add a small pinch of pepsin, a yellowish powder obtainable from chemists. Now put in a few small pieces of boiled white of egg, and keep the mixture lukewarm for an hour, stirring at intervals. The albumin is digested by a ferment in the pepsin, and dissolves in the water.

Albuminous foods in seeds are digested in a somewhat similar manner before they are used as food by the plant.

THE USE OF THE SOIL.—Notice that plants growing from seeds in damp sawdust or clean sand only do not attain their full size, but that those growing from seeds containing stored food live longer than those from seeds without stored food, and only begin to droop when the stored food is almost exhausted.

Young animals (e.g., chicks) which develop from eggs containing an abundant store of food are like the young bean plant in being able to grow to considerable size before they need to seek food for themselves. On the other hand, a frog's egg (which contains but little stored food) may be compared to a mustard seed: both tadpole and mustard seedling must begin to obtain their own food whilst they are still very immature.

Contrast the condition of plants grown in soil, and take weekly measurements of the height of average bean seedlings. Plot the results on squared paper. Also, each week take up an average seedling, dry it thoroughly in the oven, and then weigh it. Draw a curve on squared paper, showing the rate of increase in weight, and compare it with the curve of increase in height.

THE REFORM OF LATIN TEACHING.

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II.

In a previous article I argued that the reform of Latin teaching needed two supports before it had a fair chance of success. These are:

- (i) Union among reformers.
- (ii) Increased knowledge of the mother-tongue among learners. This would make a reduction of the curriculum necessary during the earlier years of school life.

I have been told since writing my first article that the *Classical Review* is prepared to offer facilities for the discussion of method. I trust that teachers will make the most of the advantage that is now open to them. It may perhaps be of some service if I mention one or two questions which I think reformers would do well to discuss and, if possible, to solve.

In the first place there is the relation of Latin to the teaching of the mother-tongue. How far is ignorance of the latter a serious drawback, and are there any means of comparing the rates of progress made by pupils (a) with and (b) without a fair knowledge of English on its formal side?

Another point of great moment is the age at which Latin should be begun. It is now generally agreed that Latin and French should not be imposed together on young boys of nine or ten, but it is to be feared that in the mad rush for entrance scholarships to the public schools this excellent rule is not carried out in practice. My own experience makes me believe that boys can begin Latin at twelve, Greek at fourteen, specialise at sixteen, and be quite ready to compete for university scholarships at eighteen or nineteen. In the case of boys who do not intend to specialise in classics, a very fair standard can be reached under the same curriculum by the seventeenth year.

So much for general principles. It remains to mention a few details.

If Latin be taught orally, and grammar be studied during the early stages *pari passu* with the use of the spoken tongue, great care is necessary that such grammar as is taught be known thoroughly. I have found the best rule to be, "Make the boys learn the genitive and gender, &c., of every noun that occurs in their work," and this rule, *mutatis mutandis*, ought to be applied universally. Even so it is necessary to sum up in a logical order such grammar as has been learnt. Personally I have found the second year the proper time to begin this systematic study of grammar, but it may well be that either an earlier or a later date is preferable. The point needs working out, and a final decision can only be reached by the collective experience of many teachers.

It is a curious fact, and one for which it is hard to give a psychological reason, that a boy may be able to speak Latin with fluency and

correctness, and yet make monstrous mistakes when he has to express himself on paper. I suppose that special brain centres need cultivating in order to write Latin, whether it be free composition or translation from English. Be this as it may, the question, when writing ought to be the object of special care, has to be solved. My own practice is to do as little written work as possible during the first year, rather more in the second, and to make a speciality of it in the third. During the third year a few minutes of each lesson are set aside for the translation, without any kind of help, of half-a-dozen sentences illustrating grammatical difficulties or peculiarities. Astonishing progress can be made by this method in a few weeks. Set themes and translation of continuous pieces are, of course, given in addition to this drill. Once more, however, I would submit that collective experience is necessary to find out the plan which works best in the majority of cases.

I have been much impressed with the value of free composition, whether from pictures or as a sort of essay. But I have been equally impressed with the wild mistakes and slovenly work done by most boys unless care be taken not to give them too free a hand. The best kind of exercise for the earlier stages seems to consist in changing the person or tense of a story which has previously been learnt by heart. The master will certainly encourage all efforts at introducing new variations, but the tendency to write rubbish should be severely checked at the outset. I believe that this tendency is due in many cases to imperfect knowledge of English, or rather of the general principles which are part and parcel of all languages. Let these be taught by means of the mother-tongue, and the mistakes to which I refer will not occur in free compositions.

Opinions have long been divided whether the reformed pronunciation is better, from the teacher's point of view, than the English. The general tendency at the present time is in favour of reform. The reformed pronunciation has, in addition to its being correct, one great advantage, which is of especial importance to a teacher who is trying to use oral methods. It is practically phonetic; in general, only one sound corresponds to one letter or group of letters. Oral teaching is twice as effective if the reformed pronunciation be adopted, and care taken that every boy learns to speak clearly, accurately, and with due attention to quantity. It is by paying attention to accurate pronunciation that the errors in written work, which I have mentioned above, can be best avoided, for each sound will be definitely associated with a fixed spelling. French teachers have been obliged to invent a phonetic script in order to teach very young boys; but in the reformed pronunciation of Latin we have a series of sounds which make the original script perfectly satisfactory. Here I would remark that the reformed pronunciation brings Latin into line with modern languages. The difficulty found by some boys in acquiring it is, so far as I can

judge, due to their ignorance of a correct French pronunciation. At any rate most of the grumbler I have met have been teachers of boys who were learning Latin but not French, or, at least, French with a very inaccurate pronunciation. Be this as it may, teachers who have taught with both pronunciations would do well to declare their experiences.

I am inclined to believe that the writing of Latin prose has, in the past, been much too mechanical an exercise, a mere application of syntactical rules rather than literary composition. Only the best pupils, such as those taking classical honours at the university, are as a rule able to escape from the bad habits which arise from treating a literary exercise as mere drill in grammatical formulæ. This fault was noticed centuries ago by Roger Ascham. I would suggest that translation of difficult English into Latin might be preceded by the learning by heart of a fair amount of good Latin prose. Some teachers in girls' schools have achieved great success by insisting that the pupil should try to commit to memory as much as possible of the reader, as it is being prepared at home and in class. Only those who have tried know how quickly this habit develops, and only those who have tried know how greatly this habit, when once formed, benefits the pupil's power of translating from English into Latin. This is another point which I would urge all teachers of Latin to consider.

Finally, I should like to point out the great advantage of the pupil's reading as many plain texts as he can, as soon as he reaches the stage when he can study the Latin authors. By all means let the power of initiative, of doing independent work, be encouraged to the utmost. Modern teachers are apt to make all work too easy, to sweep away the difficulties, and let the pupil remain in a passive state without exerting himself or exercising his intelligence. At the last Conference of Headmasters the use of plain texts was discussed and received with favour by all present. It would be interesting to know whether the favourable opinion then expressed has been adopted in practice, and, if so, with what results.

I have mentioned in this paper a few points for teachers to thrash out so as to improve the methods of teaching Latin and Greek at present in vogue. The following objection has been made, and will, in all probability, be made again. The present methods are the result of centuries of evolution; they have been improved up to the utmost, and if they are not a success, nothing will ever be satisfactory. It would not be difficult to show that the present methods are not normal; that they are the product of a period when education was a farce, and when the ideals of a healthier period had fallen into decay. But I shall not lay any stress upon this, for it is enough to point out that conditions have entirely changed within the last thirty-five or forty years. The curriculum has been growing wider and wider;

the time allowed for Latin has steadily decreased. Granted that the methods of forty years ago were successful then, they cannot produce the same, or even nearly the same, result at the present time. Unless some means be found of adapting the teaching of Latin and Greek to modern needs and conditions, classics must, and will, disappear entirely from the school curriculum. There are doubtless many who contemplate such a contingency with intense satisfaction. There are also many—and these include the majority of parents—who are apparently indifferent. I ask all such to study the question and try to reach the true conclusion. But I urge those who sincerely believe that the loss of classics would be an educational calamity to rouse themselves, and to bring their united efforts to bear upon the end which they desire to achieve.

POSTSCRIPT.—Since writing my two articles I see that the Report of the Board of Education for the year 1905-6 lays stress upon the learning of English. Mention is made of the fact that ignorance of the mother-tongue is hindering language teaching in general. It is some satisfaction to know that the Board is aware of the state of affairs.

SECONDARY AND HIGHER EDUCATION IN THE ISLE OF MAN.

THE future historian of this generation will certainly not be gruelled for lack of matter when he comes to write his chapter on Education. With the doubtful exception of the Taunton Commission Report of forty years ago we possess no picture of the state of education at any former time so complete as that contained in the numerous reports by more or less eminent hands which have been issued during the last few months. Mr. Cyril Jackson's report upon the schools of the Isle of Man is the latest, and is sure of an honourable place in the series. In the masterly and instructive handling of elaborate statistics it is at least equal to any which have preceded it. The ten clear and significant diagrams are a special feature of the work.

Out of a population in the island of about 54,000 people, 747 are in secondary schools. But 129 boys in King William's College, a well-known non-local and first-grade school, come from outside the island. Not counting these, 319 boys and 301 girls, together with 88 pupil teachers, are in schools where higher education is given, 1.3 per thousand in all. The proportion at first sight looks reasonable, but as 187 of these pupils are under twelve years of age the number of those really receiving secondary instruction cannot be put at more than 519, or 9.5 per thousand. Mr. Jackson's figures enable us to pursue the matter further. Of the 519, at least 120 are under fourteen years of age; not more than 400 are above that age. If by the side of this result is set the fact that in the public elementary schools of the island there are no fewer than 209 children, also over fourteen years of age, who will in a

year's time be reduced to a mere remnant of 20, the existence of a gap in the system which the ordinary elementary school cannot adequately fill, and the secondary school does not, is established. Mr. Jackson joins with Prof. Sadler in suggesting the supplementary class of the Scottish code as the remedy.

Many interesting questions are raised or suggested by this report, of which perhaps two or three may be selected for mention here. The Board of Education's new pupil-teacher system has set thousands of boys and girls, aged from twelve to eighteen, travelling almost daily to and fro between the sparsely populated country districts and large town schools and centres. It is far from being an unmixed good, and the wonder is that no very articulate protest has as yet been made. Douglas is the natural educational centre of the Isle of Man, and yet, partly for a reason which, being peculiar to the island, need not be stated here, but also for reasons which are generally applicable, Mr. Jackson declines to recommend concentration on Douglas. "In the winter, trains are inconvenient: for example, pupils from the north leave Ramsey Station at 7 a.m., and reach Douglas three-quarters of an hour before school opens, and do not get back to Ramsey till 6.50 p.m. To start in the dark and cold, after a hasty breakfast, is bad for growing children, especially girls; and a railway journey is not a desirable addition to the fatigues and mental excitements of a scholar's day." The instance can probably be paralleled in nearly every county in England, and it is well that the attention of teachers and administrators should be directed to this aspect of present educational policy.

One other point of similarity between the Isle of Man and the English counties to which Mr. Jackson refers is the existence of numerous small educational endowments, each attached to some one parish or group of parishes. Many of these no longer serve their original purpose, rate aid having replaced them in elementary education, and yet the difficulty of linking them up in any general scheme of secondary education is so great that there is a danger of their becoming derelict. Mr. Jackson's suggestion for their utilisation is that the income should be pooled in a common fund to cover a wider area and to be expended in scholarships. It is desirable still to maintain the local association, but most of these endowments are so small that the income would require funding for some years in order to provide a sufficient sum for a scholarship; and, moreover, the field of selection furnished by most parishes is so small that, were the scholarship limited to such an area, there is a great probability that it would be wasted on an unworthy or unsuitable candidate. By pooling the endowments of several parishes, proper competition could be guaranteed, and in a period of years each parish would get its due share.

The last point suggested by this valuable report which we can find space to touch upon is

the vital question of the duration of the secondary-school course. There is no definite local industry in the island which claims the boys at an early age; indeed, the secondary-school type of boy often migrates to the mainland to find employment. Compare this economic condition with that prevailing, for example, in Liverpool, where the demand for boy clerks between the ages of fourteen and sixteen is almost unlimited, and it may be said that in the island, if anywhere, there is a favourable prospect of the secondary schools being allowed to carry their boys to the end of the normal four years' course. Yet what are the facts? Taking the total numbers and ages of the boys in all the secondary schools of Liverpool and of the island respectively, we find that in Liverpool rather more than half, and in the island rather less than half, are in the schools by their twelfth birthday. Thereafter in both cases the numbers rise rapidly for the thirteenth and fourteenth years. There is then in the case of Liverpool an equally rapid fall; half-way through the fifteenth year thirty per cent. have gone; by the end of the sixteenth, another fifty per cent. have followed them. In the case of the island the fall is delayed, but only for half a year; nearly thirty per cent. leave before they are sixteen, more than fifty per cent. more have gone by the time they are seventeen.

Substantially the same state of things is revealed in all the reports lying between Prof. Sadler's Liverpool report, from which some of the above figures are derived—the first of the series containing statistical data—and Mr. Jackson's report, which is the latest to be issued. The inevitable deduction surely is that we must reconsider our definition of the secondary school. For reasons which are partly social, but mainly economic, the four years' course from twelve to sixteen seems at present an ideal which can be realised only in exceptional circumstances. The schoolmaster is compelled to accept the conditions of the social organisation which he serves; he can only expect to modify them by slow and indirect methods; and while still preserving our ideal and seeking to attain it, we shall be wise to make our account with the fact that for most of our boys their school career must terminate before they are sixteen, and to endeavour in the three years left to us to bring our work to completion.

German Grammar for Science Students. By Dr. W. A. Osborne and E. E. Osborne. viii+106 pp. (Whittaker.) 2s. 6d.—If this were only a little better, it would be quite a useful book; it should have been submitted in proof to someone with a really good knowledge of the language, and awkward mistakes might have been avoided and the general arrangement improved. German ä is not pronounced like a in *fame*, nor ch always like *ch* in *Scotch* *loch*; *der Gush* is not German at all; *Bercherglas*, *Häne*, *Reagengläschen*, *Rörchen*, *schwefelsaures*, are a few misprints out of many; *ich habe geblieben*, *fünftes und sechstes Hefte* are grammatical errors. The lists in the appendix should prove useful. That *Bauchnaht* is a botanical term is new to us.

THE GERMAN UNIVERSITIES.¹

RELATIVELY to the State, the German university stands midway between the complete autonomy of the English university and the State-servitude of the French *faculté*. Its professors are appointed and paid, and their activity is supervised, by the Government. At the same time it is a free scientific corporation. Its atmosphere is intellectual liberty. Its students are not, like those of Oxford and Cambridge, hampered in the pursuit of truth by social and ecclesiastical prejudices.

As its atmosphere is freedom, so its goal is, in the wider sense of the word, science. It is both an academy (an institution for the extension of scientific knowledge and the organisation of scientific labour) and a school, and it is the former characteristic which tends to be emphasised. As a school its prime object is not the professional training aimed at by the French *faculté*, nor, as here, the satisfaction of a social demand for a certain breadth of culture. It comprises both these, but its prime object is science, science as the means to the acquirement of an independent judgment, that is, to the emancipation of manhood.

Another "note" of the German university is its claim to the intellectual leadership of the people. The terms professor, and scholar or investigator, are almost always implied in one another. The university is the brain of the nation. So, too, it claims to act as a public conscience, an office which the Church, immersed in the struggle for power, has abdicated. The man in action, says Goethe, is always without conscience. It is the scholar alone, withdrawn from the turmoil, who can appreciate human values; and these days of supersensitive nationalism increasingly demand this guidance of the spiritually free.

So far the ideal; but in Prof. Paulsen's pages, as so often elsewhere, there is sometimes heard a note of foreboding. The old simplicity of German life is gone, and the change is reflected in education. Student-life has lost much of its former democratic character. In the greater universities, large salaries, the adoption of the customs of fashionable society, and the love of titles and decorations have broken down the old intimacy between teacher and pupil.

The flaws in the system itself are discussed by the author with much candour. Extending his purview, he notes the gulf fixed between the gymnasium and the university; on that side restriction, and over-pressure resulting in "school-weariness"; on this side liberty unrestrained. In the university, idealism has its natural offset in what in England we should call a certain want of practicalness. Professional pride tends to merge the teacher in the investigator pure and simple; and this, and the extremely abstract char-

acter of the work, tend in turn to an undue narrowing of the scope of education. Of schoolmasters in particular it is complained that they are too often mere technical specialists.

Such is the *substantifique moelle* of Prof. Paulsen's book, almost in his own words. It is a work which no one interested in education should neglect. Perhaps its chief merit lies in its grasp of principles, and its lucid exposition of them, so that the reader will hardly close it without feeling that his opinions have gained in precision and unity. The treatment is always historical and to some extent comparative. The book, which is never dull, is a model of clear arrangement, and it has a serviceable index and a bibliography.

A STUDY OF EURIPIDES.²

EURIPIDES is becoming the centre of interest in the Greek drama. His high reputation among the ancients is well known, but in modern times he has found less favour. M. Decharme does not take the same way of vindicating him as Dr. Verrall; he keeps fairly within the old limits of criticism, and he is consequently reduced to the necessity of calling in the "situations" to save the "plot." No one can doubt that Euripides is a master of the dramatic situation; he is as great a master of that as Sophocles, but from a different standpoint, because he regards fate emotionally. It is the plot which has called forth the most scathing condemnation of the art of Euripides. M. Decharme cannot justify his plots; no one can, indeed, do that, unless he uses some other than the conventional interpretation of them.

The rest of the book falls into two parts, one of which deals with the author's opinions and one with his technique. In extracting the opinions of a dramatist from those which he puts into the mouths of his characters, the critic is always liable to err. What are Shakespeare's opinions? We have to compare and contrast, to draw inferences from the character of the speaker, and all this is very slippery indeed. M. Decharme is judicious in his attempt. He would hardly have expected to convince every one, but at least he avoids the charge of rashness. The topics which are dealt with in this section are the poet's views of religion, philosophy, society (including the position and character of women), and politics.

When we turn to his art as a dramatist, we see discussions of his choice of subject, the action of the plays, and the chorus. Of the dramatic situations we have already spoken; the plots are analysed on p. 224 and following, and their weaknesses are pointed out. It cannot be denied that Euripides shows less sense of form than Sophocles; nor (*pace* M. Decharme) that he lacked a sense of humour. The "comic

¹ "The German Universities and University Study." From the German of Friedrich Paulsen. xxii+435 pp. (Longmans.) 15s. net.

² "Euripides and the Spirit of his Dramas." By Paul Decharme. Translated by James Loeb. xxii+392 pp. (Macmillan.) 12s. 6d. net.

elements" in Euripides remind us of snakes in Iceland, unless we include the unintentionally comic. M. Decharme is aware of the poet's clumsiness in the prologue and the epilogue, but does not suggest a possible reason for it. Finally, he is more ready than some critics to see relevancy in the choral odes.

On the whole, this is a thoughtful and appreciative book, which may profitably be read by the young student who has some first-hand knowledge of the dramas; and it is written in a bright and interesting style.

EDUCATIONAL METHODS.¹

OF the fifteen chapters of this new manual of the principles and methods of teaching, nine have been written by Prof. Welton, professor of education in the University of Leeds, and the remaining six by specialists in the departments of music, geography, mathematics, natural history, needlework, and form or handicraft. But though the pens are different, the spirit and doctrine are one, and the authors have succeeded in presenting us with a clear, logical, succinct, and inspiring treatise on this subject. This modern departure from single authorship shows at once how complex the theory and practice of education have become. Formerly nearly all the treatises on school work came from one mind; but this stage has passed, and we have now advanced to the period of professors and specialists.

The ideal Prof. Welton has set before him is to present to the student a consistent and co-ordinated body of doctrine derived from the theory, which underlies all true practice of an art. The student is asked to assimilate the principles laid down, and to make them part of that living thought which finds expression in his daily work in the class-room. In other words, he deals with the canons of the art of teaching, and trusts that the application will follow. This is a wise departure, and one we most heartily commend. Formerly—indeed, we are somewhat ashamed to admit, the practice continues—the manuals on teaching were compiled after the manner of the cookery book, in which one had only to follow the recipe, and lo! the product might have been the effort of a *cordon bleu*. But just as material things under the same name vary and fail us, so do the minds of children, and the author is quite justified in clearly stating that the true and effective way to train the practical teacher is to imbue him with broad and fruitful principles, which he himself must bring to bear on the living problems, which every day in school sets him to solve.

To be of value, however, these principles must be practical, and, excepting the clergy, we do not think that any body of professional men suffers more than teachers from advisers in the

air. This book is essentially practical, and, what is more than practical, much of it is really possible; that is, it suggests departures which it is quite likely a teacher will be willing to make, if he really desires to turn himself round and embrace the modern spirit. In each chapter sufficient details are given to guide the worker, and in nearly every chapter opinions of great thinkers are most appositely quoted as a stimulus and incentive to broader thought. John Morley's "Essay on Popular Culture," Grote's early chapters in his "History of Greece," Seeley's "Expansion of England," and Frederic Harrison's "Meaning of History" are a few of the many instances given.

Two features of this work are specially commended: the outline courses of study, especially that on the teaching of English, chapter viii., and a list at the end of each chapter, of books recommended for the use of teachers, with the prices attached. No fewer than 143 works are named, and the whole forms one of the most copious and valuable catalogues we have lately seen.

THE WORKS OF SHAKESPEARE.²

IT is not too much to say that this book will become indispensable to all engaged in the study or teaching of Shakespeare. Its completeness, its range, its suggestiveness, and its fullness of matter are marvellous; for it embodies all recent research of any note or value. Mr. Luce starts by treating the matter of his volume somewhat baldly. He says it is a "matter of arithmetic; the pleasure we find in a work of art will be in proportion to our knowledge." That is a proposition from which many genuine critics would shrink; but as the author proceeds with his task his book grows luminous and valuable in a singular degree.

As a handbook it completely justifies its title, but it suggests so many lines of inquiry that it is valuable beyond most volumes of its kind, and its style is admirable. The necessary historical facts are clearly set forth, and each play is dealt with first in this aspect; then follow the critical remarks, and these are splendid. They have, in many cases, been stated by other commentators, but Mr. Morton Luce's own share in them is large, and the whole is beautifully expressed. His paragraphs sometimes are marvels of logic and literary beauty.

Concerning Shakespeare's apprenticeship some remarks on p. 71 are worth pondering; so are those on p. 235, on his technical defects; and we are wholly at one with Mr. Luce in his estimate of Shakespeare's method of composition. What he says of Lady Macbeth (p. 319) is penetrating and important, and if his estimate of Falstaff (p. 398) seems a little too high, he supports it ably. A valuable point is made where he notes

¹ "Principles and Methods in Teaching." By Prof. James Welton. vii+554 pp. (Clive) 4s. 6d.

² "A Handbook to the Works of William Shakespeare." By Morton Luce. viii+463 pp. (Bell.) 6s.

that Shakespeare's love of or interest in music declined after 1600 A.D. (p. 395), though we do not follow his opinion of modern opera (p. 393), which is a matter we cannot here discuss. His analysis of Shakespeare's relation to the canons of Aristotle (pp. 416 *et seq.*) is worthy of deep attention.

Altogether, this volume is a notable contribution to Shakespearean scholarship by reason of the clearness of its method, the vigour and independence of its criticism, the unusual fullness of its information, the excellence of its style, and the wide view and deep insight which it exhibits. In many points the author combines his criticism of Shakespeare with his earlier volume on Tennyson; to such an extent, indeed, that it seems necessary, to a true appreciation, that it should be founded on a study of both volumes. But our admiration for this present work is great, and we heartily commend it.

THE MOST NOTABLE SCHOOL BOOKS OF 1906.

In accordance with our usual custom, we give below short lists of notable books published during 1906 in the chief subjects of the secondary-school curriculum. In compiling the lists we have secured the assistance of experts in touch with the needs of secondary schools of every grade. Attention has not been confined to books reviewed in these columns, and teachers who examine the books of last year included in the following lists may rest assured that they have become acquainted with the scope and contents of many of the best recent school books.

In cases where the title of a book is not a sufficient indication of its character a few explanatory notes have been added.

Modern Languages.

"*Histoire de la Littérature française classique, 1518-1830.*" By F. Brunetiére. Tome I. De Marot à Montaigne. Deuxième Partie: La Pléiade. (Paris: Delagrave.) 2.50 francs.

An excellent example of the skill and sympathy of the great French critic who has just passed away.

"*Lectures françaises: Géographie et Histoire.*" By W. M. Poole and M. Becker. (Blackie.) 2s. 6d.

"*French Historical Reader.*" By H. N. Adair. (Bell.) 1s. 6d.

"*Graduated French Unscens.*" By Victor Oger. (Arnold.) Parts I. to IV., 8d. each.

"*Nouvelle Grammaire française.*" By J. G. Anderson. (Methuen.) 2s.

"*A Public School French Primer.*" By O. Siepmann and E. Pellissier. (Macmillan.) 3s. 6d.

"*Handbuch zur Geschichte der deutschen Literatur.*" By Adolf Bartels. (Leipzig: Avenarius.) 5s.

Clear and interesting.

"*A First German Reader.*" By D. L. Savory. (Arnold.) 1s. 6d.

"*A First German Course for Science Students.*" By Prof. H. G. Fiedler and F. E. Sandbach. (Moring.) 2s. 6d.

"*Cassell's New German Dictionary.*" Edited by Karl Breul. 7s. od. and 10s. 6d. net.

Quite the best dictionary at a moderate price.

Rippmann's "*Picture Vocabulary.*" French: First Series. (Dent.) 1s. German: First Series. (Dent.) 1s.

"*Dent's First Spanish Book.*" By F. R. Robert. 2s. net.

The only introduction to Spanish on reform lines; a very interesting contribution to method.

Classics.

For the Use of Teachers.

Amongst helps to the understanding of classical antiquity should be mentioned the following:

"*The Hibet Papyri.*" Part I. Edited, with Translations and Notes, by Drs. Grenfell and Hunt. (Egypt Exploration Fund.) 45s.

This admirable book, besides new classical fragments and portions of classical texts, contains a mass of material which throws light on ancient life, and is a most valuable help to the student.

"*An Introduction to Greek Epigraphy.*" Part II.

"*The Inscriptions of Attica.*" By C. S. Roberts and E. A. Gardner. (Cambridge University Press.) 21s.

A learned and scholarly book, giving the chief Attic inscriptions with full commentary.

"*A History of Ancient Pottery.*" By H. B. Walters, based on the work of Samuel Brick. Two vols. With 300 illustrations, including eight coloured plates. (Murray.) 63s. net.

"*Coin Types, their Origin and Development.*" By Dr. George Macdonald. (MacLehose.) 1os. net.

A brilliant and original work, advancing by one stage this thorny subject.

"*A Grammar of New Testament Greek.*" I. Prolegomena. By J. H. Moulton. (T. and T. Clark.) 1os. 6d.

A brilliant contribution to historical Greek grammar.

"*Historical Greek Coins.*" By G. F. Hill. With thirteen plates. (Constable.) 1os. 6d. net.

Contains the chief coins which illustrate Greek history, and a general account of coins.

Scholars' Editions.

"*The Birds of Aristophanes.*" The Text revised, with a Translation in Corresponding Metres, Introduction, and Commentary. By B. B. Rogers. (Bell.) 1os. 6d.

"*Demosthenes against Meidias.*" Edited by W. W. Goodwin. (Cambridge University Press.) 9s.

School books of the usual unintelligent type have been plentiful as usual, but the year has been singularly barren in those which differ from that type. We have only to mention three which embody the result of recent experiments in the reform of classical teaching. Experience will, we hope, suggest further improvements upon these first attempts.

"*The Perse First Latin Book.*" By W. H. S. Jones. (Cambridge: Macmillan and Bowes.) 2s.

In this Mr. Jones carries out the principles laid down in his book on "*The Teaching of Latin*" (Blackie). The book is meant for boys of eleven to twelve, and it contains everything necessary for them to learn up to the reading of the first author.

"*A First Greek Course.*" By Dr. W. H. D. Rouse. (Blackie.) 2s. 6d.

Contains a similar course for the first two terms of Greek (age fourteen to fifteen), and covering the whole essentials of accidence and syntax, with the necessary exercises and marking.

"The Greek War of Independence (1821-1827)." Being a Greek text for beginners, with Notes, Exercises, Vocabularies, and Maps. By C. D. Chambers. (Swan Sonnenschein.) 3s.

This book also contains the necessary grammar for the first course, based on a continuous narrative which is graduated in difficulty from page to page. The book is well done, in spite of some defects in the Greek style, which may be mended in a second edition, and a certain lack of clearness in the arrangement of the non-textual part.

School Editions.

"Selections from the Septuagint," according to the text of Swete. By F. C. Conybeare and St. George Stock. (Ginn.) 6s.

Contains an admirable summary of Hellenistic grammar.

"Selections from Lucian." By F. G. Atkinson. (Ginn.) 6s.

With good introductions.

We must also mention the excellent texts of "Demosthenes," Vol. I., by S. H. Butcher, and the "Annals of Tacitus," by C. D. Fisher (Clarendon Press), 4s. and 4s. 6d.

English Language, Grammar, and Composition.

"A Class Book of English Grammar." By W. E. C. Clarke and A. C. Muller. (Longmans.) 2s. 6d.

Adapted to give a good grounding. Well equipped with examination questions.

"Progressive Course in English Grammar and Composition." Part I., for junior classes, 6d.; Part II., for senior classes, 9d. (Oliver and Boyd.)

Valuable little books.

"Sentence Analysis." By one of the authors of "The King's English." (Clarendon Press.) 1s. 6d.

Specially written for lower forms of public schools.

"Exercises for Parsing in Colour." By E. Hastings. (Edward Arnold.) 1s. 6d.

Well suited for young pupils.

"The Sounds of Spoken English." By Prof. Walter Rippmann. (Dent.) 1s. 6d.

An excellent manual that was much required.

"The King's English." By H. W. F. and F. G. F. (Clarendon Press.) 6s.

For the teacher or the library. Exceedingly useful. Well planned and well executed.

"Blackie's Standard Dictionary." (Blackie.) 2s.

Concise, comprehensive, and thoroughly trustworthy. Has very useful appendices.

"A Chapter on Essay Writing." By A. S. West. (Cambridge University Press.) 6d.

The excellent chapter from the latest edition of Mr. West's Grammar.

"Essays in the Making." By Eustace Miles. (Rivingtons.) 3s. 6d.

Likely to be very useful.

"Précis and Précis Writing." By A. W. Ready. With key. (Bell.) 4s. 6d.

A comprehensive manual.

"The Essentials of Composition and Rhetoric." By A. H. Espenshade. (Heath.) 3s. 6d.

Excellent matter, practically and lucidly arranged.

"Historical Study of the Mother Tongue." By Prof. H. C. Wyld. (John Murray.) 7s. 6d.

Very important for teachers. A thorough and learned work, based on the latest results of research.

History.

For the Use of Teachers.

"The History of England from the Earliest Times to the Norman Conquest." By T. Hodgkin. (Longmans.) 7s. 6d. net.

The first volume of Longmans' standard "Political History of England."

"England under the Normans and Angevins." By H. W. C. Davis. "England under the Tudors." By A. D. Innes. "England under the Stuarts." By G. M. Trevelyan. (Methuen.) 10s. 6d. net each.

Three of the seven volumes of which this "History of England" is to be composed.

"English Historians." By A. J. Grant. (Blackie.) 2s. 6d.

An account of English-writing historians of England, with illustrative extracts.

"Syllabus of British History." Parts VI.-IX. By C. H. K. Marten. (Spottiswoode.) 6s. net.

Suggestive headings for *viva voce* work.

"Syllabus of Continental European History." By O. H. Richardson. (Ginn.) 3s. 6d.

Headings for lectures.

"Lectures on Modern History." By Lord Acton. (Macmillan.) 10s. net.

Cambridge professorial lectures by the master of modern history.

For Class Use.

I. EUROPEAN HISTORY.

"Readings in European History." Vol. II. By J. H. Robinson. (Ginn.) 7s.

Extracts from sources, with a running commentary.

"Main Landmarks of European History." By F. N. Dixon. (Clive.) 2s. "Heroes of European History." By L. Creighton. (Longmans.) 1s. 6d.

Two little introductory books.

"Gateways to History." (Edward Arnold.) 10d.-1s. 6d.

Seven booklets, introductory to history. Books V. and VI. tell of European history.

II. ENGLISH HISTORY.

"Asser's Life of King Alfred." By A. S. Cook. (Ginn.) 2s. 6d. "Illustrative History." Stuart Period, by J. W. B. Adams; Mediæval Period, by A. Kimpster and G. Home. (Horace Marshall.) 2s. 6d. each.

"Source" books.

"An Advanced History of Great Britain." By T. F. Tout. (Longmans.) 5s.

The best text-book for elder scholars.

"War and Reform, 1789-1837." By A. Hassall. (Rivingtons.) 3s.

A good "period" manual. One of a series.

"Rights and Duties of Citizenship." By W. D. Aston. (Clive.) 1s. 6d.

For elder scholars.

"Our English Towns and Villages." By H. R. W. Hall. (Blackie.) 1s. 6d.

For younger pupils.

III. LOCAL HISTORY.

"A School History of Somerset." By W. Raymond.

"A School History of Warwickshire." By B. C. A. Windle. (Methuen.) 1s. 6d. each.

"The Story of Exeter." By A. M. Shorto. (Exeter: Commin.) 1s. "Lancashire." (Pitman.) 3d. and 4d.

Both, in proportion to size, useful and interesting.

Geography.

In compiling the following list, space has compelled us to omit several works which in ordinary years would have been included.

General.

"Progressive Course of Comparative Geography." By P. H. L'Estrange. (Philip.) 6s.

A combined geography and atlas, designed for a complete school course.

"The Preliminary Geography." Vol. I. of the "Oxford Geographies." By A. J. Herbertson. (Clarendon Press.) 1s. 6d.

Chief features: causes and consequences *plus* descriptive matter and numerous illustrative maps.

"Geographical Gleanings." By Rev. F. R. Burrows. (Philip.) 1s. 6d.

Suggestive hints to teachers.

"Practical Teaching of Geography in Schools and Colleges." By A. Morgan. Fourth edition. (Philip.) 6d.

Special.

"The British Isles." Vol. II. of a "Scientific Geography." By E. W. Heaton. (Ralph, Holland.) 1s. 6d.

"Kent," "Yorkshire." Readers of the "English Counties" series. (Blackie.) 8d. each.

"Handbook of the British Colonial Empire." By W. H. Mercer and A. J. Harding. (Waterlow.) 2s. 6d.

Based on the "Colonial Office List": administrative and historical sections more trustworthy than the geography.

"Mediterranean and Eastern Colonies." Vol. I. of Lucas's "Historical Geography of the British Colonies." Second edition. Revised by R. E. Stubbs. (Clarendon Press.) 5s. ,

"The Dominion of Man." By E. Protheroe. (Methuen.) 2s.

On the whole a good epitome of commercial geography.

Atlases.

"The Model Atlas." (Philip.) 6d.

Alternate relief and political maps.

"Handy Atlas of Modern Geography." Second edition. (Stanford.) 10s. 6d.

Useful as a reference, or to accompany newspaper reading; crammed full of names.

"Atlas of the World's Commerce." By J. G. Bartholomew. (Newnes.) Twenty-two fortnightly parts at 6d. each.

An excellent publication, containing also a gazetteer of commercial commodities by W. A. Taylor, and an introduction to economic geography by G. G. Chisholm.

"The Harmsworth Atlas and Gazetteer." (Philip.) Thirty-six fortnightly parts at 7d. each.

Commenced publication on October 30th, 1906, and advertised as the "most complete, most accurate and up-to-date" atlas of the day.

Wall Maps.

"British Isles." One of the "Imperial Series." (W. and A. K. Johnston.) 21s.

"Asia," "Palestine." Stanford's "New Orographical Series," under direction of H. J. Mackinder. (Stanford.) Mounted on rollers, 21s. each.

Accurate and pleasing; well worth getting.

Mathematics.

"A Heuristic Arithmetic." By Clifford Granville and C. E. Rice. ix+273 pp. (Horace Marshall.) 2s. 6d.

Divided into "Method," 130 pp., for teachers; "Examples," 100 pp., for pupils; and answers. An excellent book for very young beginners.

"The Winchester Arithmetic." By C. Godfrey and G. M. Bell. ix+199 pp. (Cambridge University Press.) 3s.

A collection of examples of great freshness. A straightforward treatment is given; and the tricky questions which most books inherit from generations of examination papers are omitted. Logarithms are included. A teachers' edition (6s.) contains answers and notes on method, interleaved with the examples.

"Examples in Arithmetic." By C. O. Tuckey. xii+241+xl pp. (Bell.) 3s.

Tricky "examination" examples are placed in a section by themselves. Logarithms are included; also examples on numerical trigonometry and on the applications of proportion to physics.

"A New Shilling Arithmetic." By C. Pendlebury and F. E. Robinson. xii+175+xxxiv pp. (Bell.) Without answers, 1s.; with answers, 1s. 4d.

Seems much the best of several new Arithmetics at this price.

"A First Course of Algebra." By A. E. Layng. viii+175+xxi pp. (Blackie.) 2s. 6d.

Reaches quadratic equations. A good course, except that simple equations seem unduly postponed.

"A Second Geometry Book." By J. G. Hamilton and F. Kettle. vi+292+xii pp. (Edward Arnold.) 3s. 6d.

The work is skilfully arranged so as to lead through guesses and experiments to the discovery of geometrical truths. An introduction to trigonometry is included.

"Geometry." By S. O. Andrew. xi+218 pp. (Murray.) 2s.

This book (entirely recast in this edition) contains plane and solid geometry and trigonometry to the solution of oblique triangles. It begins with a good course of experimental work; then chapter viii. is devoted to the deductive method of proof, which is used thenceforward.

"A Manual of Geometry." By W. D. Eggar. xxiii+325 pp. (Macmillan.) 3s. 6d.

Contains good experimental work. In chapter x. formal proofs are begun. These are indicated only, and should be written in full by the student in a note-book. A chapter on mensuration of solids is included.

"Trigonometry for Beginners." By Rev. J. B. Lock and J. M. Child. viii+195 pp. (Macmillan.) 2s. 6d.

An attempt to treat trigonometry as a practical subject. Five-figure tables are included, and stress is laid on determining the error possible in interpolation and in the calculations for solving triangles. Surveying instruments are explained.

"A New Trigonometry." By R. F. D'Arcy. viii+84 pp. (Methuen.) 2s. 6d.

An easy, well-arranged course of trigonometry to solution of triangles, excluding the addition formulæ.

"Trigonometry for Beginners." By J. W. Mercer. xii+351 pp. (Cambridge University Press.) 4s.

This excellent book, which includes the addition formulæ and their applications, has many novel features. The tangent is first introduced, and the sine and cosine later. This makes the early chapters very easy. In solving triangles, the use of the haversine formula is included; also the traverse table is explained.

"Algebraic Geometry: a New Treatise on Analytical Conic Sections." By W. M. Baker. ii+325+xxiii pp. (Bell.) 6s.

Except for one chapter, on the general equation, this deals with conics referred to their axes. Two striking features are sections on locus problems, and sections on the properties of conics in which geometry and algebra are both used according to convenience. An excellent book for those who are not specialists in mathematics.

"Clive's Mathematical Tables." ii+49 pp. (University Tutorial Press.) 1s. 6d.

Contains two-page tables of logarithms, &c., to five figures, with corrections to enable accuracy to be obtained when the numbers in the difference columns are large. Should be useful in doing away with uncertainty as to the accuracy to be expected.

"Elementary Problem Papers." By C. V. Durell. vii+120 pp. (Edward Arnold.) 1s. 6d.

Should be useful for those beginning to specialise in mathematics.

Physics and Chemistry.

For Class Use.

PHYSICS.

"Elementary Treatise on Physics." Translated from Ganot's "Éléments de Physique." Seventeenth edition. Edited by Prof. A. W. Reinold. (Longmans.) 15s.

The revision of this popular text-book has been thorough, and the result is satisfactory in every respect.

"The Properties of Matter." By C. J. L. Wagstaff. (Clive.) 3s. 6d.

"Practical Physics." By W. R. Bower and J. Satterly. (Clive.) 4s. 6d.

CHEMISTRY.

"Conversations on Chemistry." Part II. By W. Ostwald. Translated by S. K. Turnbull. (Chapman and Hall.) 8s. 6d. net.

"Elements of Quantitative Analysis." By Dr. G. H. Bailey. (Macmillan.) 4s. 6d.

"Practical Exercises in Chemistry." By G. C. Donington. (Macmillan.) 2s. 6d.

Very suitable for use in secondary schools.

"Joseph Priestley." By T. E. Thorpe, F.R.S. (Dent.) 2s. 6d. net.

For the Use of Teachers.

"Cours de Physique." By J. Jamin. Troisième Supplément (Radiations, Electricity, Ionisation). E. Bouty. (Gauthier-Villars.) 8 francs.

"Lehrbuch der Physik und Meteorologie." Müller-Pouillet. Tenth edition. First volume, in two parts (Mechanics and Acoustics). (Vieweg und Sohn.) 7 marks and 3.50 marks.

"Lehrbuch der Physik." By O. D. Chwolson. Vol. III. (Vieweg und Sohn.) 16 marks.

This volume includes heat and thermodynamics. The complete treatise bids fair to prove itself the leading text-book of physics.

"Radio-activity." By E. Rutherford. Second edition. (Cambridge University Press.) 12s. 6d. net.

This volume has no rival as an authoritative exposition of what is known of the properties of radio-active bodies.

"Conduction of Electricity through Gases." By Prof. J. J. Thomson. Second edition. (Cambridge University Press.) 16s.

The original volume has been completely revised, and extensive additions have been made. A standard work by the pioneer investigator in the field of the corpuscular theory of electricity.

"Magnetische Kraftfelder." By H. Ebert. Second edition. (Leipzig: J. A. Barth.) 7 marks.

"The Theory of Experimental Electricity." By W. C. D. Whetham. (Cambridge University Press.) 8s. net.

An elementary text-book—an admirable exposition of all that the theorists have discovered so far.

"Thunder and Lightning." By Camille Flammarion. Translated by W. Mostyn. (Chatto and Windus.) 6s. net.

"Die optischen Instrumente." By Dr. M. von Rohr. (Teubner.)

This gives a simple account of the development and modern theory of optical instruments.

"The Life and Experiences of Sir H. E. Roscoe." Written by Himself. (Macmillan.) 12s. net.

Natural History.

Botany.

"A First Course in Practical Botany." By G. F. Scott Elliott. (Blackie.) 3s. 6d.

Suitable for students at the public school and technical college stages.

"Plant Life: Studies in Garden and School." By H. F. Jones. (Methuen.) 3s. 6d.

A nature-study book adapted to the needs of primary and secondary schools.

"The School Garden: a Handbook of Practical Horticulture for Schools." By J. E. Hennesey. (Blackie.) 1s.

A most useful book for those desirous of turning the school garden to best account educationally.

"The Physiology of Plants." Vol. III. By W. Pfeffer. Translated by A. J. Ewart. (Clarendon Press.) 18s.

An advanced work dealing with metabolism and sources of energy in plants.

"Handbook of Flower Pollination, based upon H. Müller's Work 'The Fertilisation of Flowers by Insects.'" Vol. I. By P. Knuth. Translated by J. R. Ainsworth-Davis. (Clarendon Press.) 18s.

"School Gardening for Little Children." By Lucy Latter. (Sonnenschein.) 2s. 6d.

"Alien Flora of Britain." By S. T. Dunn. (West, Newman.) 5s.

Zoology.

"Insect Life." By J. H. Fabre. (Macmillan.) 2s. 6d.

A cheap issue of perhaps the most delightful book ever written on insects.

"Life and Evolution." By F. W. Headley. (Duckworth.) 8s.

A non-technical account; the outcome of lectures to public-school boys.

"Cambridge Natural History." Vol. I. Protozoa, Porifera, Coelenterata, Ctenophora, and Echinodermata. (Macmillan.) 18s.

"The Biology of the Frog." By S. J. Holmes. (Macmillan.) 6s. 6d.

An exhaustive compilation.

"Outlines of Zoology." By J. A. Thomson. Fourth edition, revised and enlarged. (Pentland.) 15s.

Middlesex. 128 pp. (Blackie.) 8d.—This is one of the "English Counties Series of Supplementary Readers," of which we have already noticed others. It is, like its fellows, well written, clearly printed, plentifully illustrated with pictures and maps. Besides its thirty-eight chapters there is a synopsis. London is deliberately excluded, and the rest of the county is described topographically and, incidentally, historically. Our only complaint is that, while we have references to the two kings of Brentford, their story is not told.

POSITION OF ENGLISH SECONDARY EDUCATION.¹

THE organisation and development of the education given in secondary schools is the most important educational question of the present day. It is the pivot of the whole situation, as it affects the efficiency, intelligence, and well-being of the nation. The scope and character of primary education are now pretty well settled. Much remains to be done in improving it; but the problems, so far as they are strictly educational, are uncontentious, and admit of approximate solution. Further advance will be on well-ascertained lines. The experience of thirty-five years' working has borne fruit. But as soon as we pass beyond the sphere of elementary education proper (or what may conveniently be called by the almost disused name of primary education), *i.e.*, beyond what is provided and compelled by law for the whole child-population of the nation, we plunge into chaos. Higher education has grown up in this country almost of itself, without any continuous or uniform guidance from the State.

The provision and aid of super-primary education is now a function of all local education authorities. But the essentials of the problem are not yet authoritatively settled or even clearly stated. Great confusion of thought still exists throughout the country, and through all the writing and discussion about it principles are only slowly emerging, and have not been reduced to order. Local authorities have to proceed experimentally, and gain their wisdom by experience. It is inevitable that there should be many errors, many false starts, much waste labour, and misapplication of machinery. The function of the central authority is to watch, encourage, warn, co-ordinate; also to select for support, and to command to localities, certain types which are fundamental in any complete scheme of national provision; and to see that certain important things (which will be different in different places) are not lost sight of, and that the more important shall, so far as possible, take precedence of the less important.

With the object of producing a greater clearness of thought in regard to the main purpose to be kept in view the Board has attempted, in the exercise of this function, to set a standard and supply a working definition of the secondary school as distinct from other forms of super-primary education. This is given in the preliminary paragraph of the regulations for secondary schools as a school "which offers to each of its scholars a general education of a wider scope and higher grade than that of an elementary school, given through a complete progressive course of instruction continuing up to and beyond the age of sixteen."

It is further laid down in the regulations that a secondary school, as thus defined, must offer at the least a full four-year course providing instruction in a group of subjects so selected as to ensure due breadth and solidity in the education given. These subjects are defined as (i) the English language and literature, together with geography and history; (ii) a language other than English; (iii) mathematics and science, both theoretical and practical; and (iv) drawing. In the case of girls, practical housewifery must be provided for in the course, and as regards both boys and girls some provision must be made for manual work and for physical exercises. The object of these rules and of certain further rules more closely defining these, is to ensure, even at the risk of some interference with free

experiment, a certain amount of breadth and richness in the curriculum of secondary schools, and to provide against schools recognised under that name offering only an education which is stunted, illiberal, unpractical, or over-specialised. With the growth of educated public opinion it may be possible, and, whenever it becomes possible, it is highly desirable, to relax these requirements in schools of tested efficiency, and to leave them a larger freedom in devising and executing schemes of education of their own.

The results of the various inspections, and especially the full inspections of secondary schools throughout England that have recently been conducted by the Board, can now be brought together sufficiently to reveal certain general features of secondary-school work in England to which attention must be directed. The most conspicuous fact which emerges from a review of the reports on the inspection of 362 secondary schools in England conducted since December, 1904, is their demonstration of how much has yet to be done. There are many hopeful signs, there is real and widespread interest, but the shortcomings are too often little less than disastrous.

Perhaps the most serious and most widespread defect in the schools inspected by the Board in the last eighteen months is the bad teaching of English. There is scarcely a report in which complaint is not made of the English teaching in one direction or another. Either the teachers are not qualified to teach it, or there is too little time given to the subject; there is too little attention given to reading, and the recitation books are not well chosen; or they do not exist at all, for collections of extracts are *biblia abiblia*; or there is no instruction except in formal grammar; or, most frequent of all, there is no graduated course of study. The following extracts from reports of inspectors justify these serious strictures: "There is a tendency at present to treat the English books as a matter for scansion, analysis, &c., and as a quarry for miscellaneous allusions, rather than as a means of culture and a training in logical expression. Some of the books studied are chosen deliberately from the former point of view." "In the term when the school was inspected no literature whatever was being taught. The grammar lesson heard in Forms II. and I. was all but worthless. An unsuitable text-book was being dealt with mechanically; the boys, having no principles to guide them, made a series of bad guesses. It would be better for this class to drop grammar and be taught instead to read and understand a simple poem or two."

The evils that follow from this are only too frequently apparent. The children are careless and faulty in speech, their answers are mumbled or inaudible, and, as a further consequence, the standard of work in French and German is low.

It is only fair to say that, except in schools of the first rank, the language teaching in schools for girls is on the whole better than in those for boys of a corresponding type; especially is this true of French, and to some extent of English also.

The disappearance of Greek, and even Latin, from many of the schools under the Board's inspection makes English a more important branch of the curriculum than ever before. In many cases two foreign languages are begun simultaneously, an arrangement that must lead to confusion in the mind of the pupil. In one school the pupils in Form I. commenced Latin and French together. "Many of the scholars in this form are," says the inspector, "of such low general attainment, and, in particular, so ill-grounded in English, that the acquirement of the elements even of one foreign language constitutes a

¹ Abridged from the section dealing with secondary education in the Report of the Board of Education for the year 1905-6 (Cd. 2270, price 5/-).

heavy tax upon their powers. Having regard to all the circumstances of the school, it is, indeed, probable that nothing is gained by the inclusion of a second foreign language in the school curriculum. If the time now assigned to Latin were in part devoted to the strengthening of the English work, and in part drawn upon to make a daily French lesson possible in each form, the educational gain would be very real and the corresponding loss slight."

Another general statement that can be made about these schools is that in almost all of them, whatever their type, the staff of assistants is underpaid and often overworked. As a result, teachers with inadequate qualifications are entrusted with the instruction of children who, when they are grown men and women, should do the brain work of the nation. Even where the teacher is properly equipped he is depressed and disheartened by the conditions under which he is obliged to work, and a feeling of restlessness among the staff is engendered which results in too frequent changes; the prevalence of short-service teachers impairs the continuity of tradition.

In the smaller schools the headmaster or headmistress is frequently too much occupied to be able sufficiently to supervise the work of the assistant staff; yet in such schools, owing to the small salaries and to the poorer quality of the teaching, the need of supervision is greatest.

The introduction (into the secondary school) of pupil teachers and probationers (*i.e.*, intending pupil teachers) in numbers exceeding the number of girls previously in the school has, of course, caused difficulties of organisation. These have been overcome for the moment; but further changes will be necessary as the progress of time renders possible the more complete amalgamation of the school and the pupil-teacher centre. But this is not all: "The newcomers have brought new problems and responsibilities to the assistant staff, and the mere increase in numbers has, of course, necessitated bringing in new mistresses. The result is that the staff needs an unusual amount of supervision and guidance if the important work undertaken is to be properly carried out."

Further, in such schools none of the staff have an appreciable proportion of spare time during school hours, so that scanty opportunity is given for original study, for reading new authors and subjects, and for working up old. In such circumstances neither improvement in teaching methods nor increased freshness in dealing with new subject-matter can fairly be looked for.

Finally, it is only in exceptional cases that there is at present any effective test, graduated according to age, imposed upon scholars at entrance. Until, however, such a test has come into general use, classification cannot be satisfactory.

From the facts respecting the various types of public secondary schools, and by the testimony of all the most competent judges, it is clear that *an improved standard of teaching power in secondary schools* is at the root of all improvements and developments. Whether the deficiency be in number, or in training, or in academic qualification and teaching experience, the whole teaching staff in very few cases reaches the standard necessary for full efficiency.

The reports of our inspectors prove that much—the reformer in a hurry may even say all—remains to be done, not only as regards *personnel* and the methods the teachers adopt, but as regards the material and mental conditions (buildings, equipment, management, leisure, and salaries) under which the work is done. But these things cannot be put right in a couple of years, nor by a stroke of the pen. The improvement, even the amount of financial help

from the locality or the State, must come gradually if the desired effects are to follow and to be permanent.

It is, however, idle to expect full efficiency from a teaching staff which is inadequately paid; and in the majority of schools a substantial increase of the salary fund, with provision for both increment for length of service and for superannuation, must be regarded as a matter, not only in itself urgent, but a necessary condition for getting the full value out of other improvements.

In view of these considerations, as well as of the increasing importance now universally recognised as attaching to a systematic provision of super-primary education, a substantial increase in the amount of State aid made available for secondary schools has been determined upon, and is provided for in the Estimates of this year. Important matters of principle, however, inevitably arise as regards the allocation of the increased grants and the eligibility or ineligibility of various types of secondary schools for State aid, which require careful investigation, and may involve discussion in Parliament. For this reason the modified or supplementary regulations on which the new grants will depend will not be issued until a later date. It will be observed that these questions do not relate primarily to the kind of education given, but to the conditions under which it shall be given, as regards management, finance, accessibility, and degree of public control. But it is no less clear that these questions are in vital relation to another question which is of a strictly educational nature. This question, on the solution of which the whole character of the system to be adopted will depend, is how the type of super-primary education represented by the secondary school may be organically connected with the national system of primary education open to the children of the whole nation, and maintained wholly by public funds, without lowering the standard of work to be attained.

Secondary education differs from elementary education in two ways, and the difference between them may be expressed in two sets of terms according to the point of view from which the matter is approached. The difference is, from the one side, a difference of stage, from the other, a difference of kind. The secondary school, that is to say, may be regarded either as taking over, at a certain age and a certain stage of proficiency, the children of the elementary school, and developing their education in a larger manner to a higher point; or as providing for children an education, which either from the very beginning or from a very early stage, is differently planned from that of the elementary school, and directed towards a different though kindred object. Both these types of secondary school are well established, and, under existing social conditions, both are alike necessary. But the former is, and must tend more and more to be, the predominant type as regards the bulk of the nation; and it is in it that the problem of continuity is at once most difficult and most acute.

Education is one. Any dislocation in its course is at the best but a necessary evil. It ought to be continuously progressive from the time when a child first passes beyond the home and goes to school up to the time when school life ceases, when the boy or girl ceases to be under educational tutelage, has been taught how to learn, and can thenceforth go on to learn for himself or herself. In an ideal commonwealth, this process would be complete for the whole youth of the nation. This is a high ideal, and how far removed it is from existing facts, or from any state of facts which can be contemplated as soon to be possible, is at once obvious. But short of it there is no

finality: and the higher the aim is fixed, the higher the attainment is likely to be.

The problem which has to be faced is how to unify education by liberalising the whole of it. A break of gauge is harmful and wasteful; but much may be done to ease it and alleviate its drawbacks. It is difficult to imagine that the social organisation can, at least for a long time to come, be so adjustable and elastic as to be able to do away with it altogether. A class education in compartments after the fashion of Plato's "Republic" is contrary to the essence of democracy. It is true that in the civic scheme of the "Republic" provision is made for transfusion of children from the ruling to the labouring class, and *vice versa*; and such in effect was the system of the Middle Ages in England. But a democracy is naturally jealous of a privileged class; and one of the dangers that have to be guarded against is that this jealousy may restrict the province or contract the scope of higher education. One of the points which demand the most careful and thoughtful treatment is how to provide State-aided secondary education in the degree to which, and at the points at which, it is really needed, and how to ensure free access to it for children of every class according as the individual is intellectually capable of receiving profit from it.

The age of twelve is that about which transference from the primary to the secondary school normally occurs; and the required course of secondary schools certified or aided by the State in England is fixed with reference to this fact. It is the age (with certain comparatively unimportant exceptions) at which statutory exemption from school attendance begins; and it is the age up to which the transference from one type of school to the other can be effected with comparatively little loss, though it is the experience of teachers that the loss even then is considerable, and that better results are obtained when the transference takes place earlier. But difficulties arise from various sources: from the lack of any clear delimitation between the provinces of the elementary and of the secondary school; from the natural ambitions and justifiable ideals of the best elementary-school teachers; from apathy or want of intelligence on the part of parents; from the feeling, still unfortunately prevalent, which regards the secondary school as a mere "finishing" place for a year or two; and also from the past history of the secondary schools which have grown up either, on the one hand, as schools for children of a distinct social class, or, on the other, as extensions of the elementary school that did not rise beyond elementary methods, standards, and traditions.

The possibility of nationalising secondary schools is intimately connected with the question of fees. Elementary education is now (with but few exceptions) free. In secondary schools, those maintained by local authorities, as well as others, a fee of a substantial amount is normally charged. Out of the 685 schools recognised for the session 1905-6, only four were wholly free, and only twenty-eight charged a fee under £3 a year. The fee was £3 in forty-six schools, and in the remainder exceeded that figure. The London County Council has determined on fees of £6 6s. and £10 respectively in the two grades of secondary schools which it is in course of providing. In endowed schools the limits of fee are fixed by scheme in each case. From £6 to £8 or £10 may perhaps be regarded as normal. But in some cases the fee is considerably higher, being more than £13 in the case of seventy-seven schools.

It is important that parents and others should recognise that good education cannot be bought cheaply, and that

two things must always be borne in mind if a secondary school is to serve the purpose which they have in view: the children sent there must be fit to profit by the education given, and the secondary school must correspond with its title, and must give an education higher in scope and character than that of an elementary school. If these two conditions are not satisfied the money of parents, rate-payers, and taxpayers alike will be largely wasted on the maintenance of a school which is a secondary school only in name.

HISTORY AND CURRENT EVENTS.

"THE King can do no wrong." This maxim . . . means . . . that by no proceeding known to the law can the King be made personally responsible for any act done by him; if (to give an absurd example) the Queen (Victoria) were herself to shoot the Premier through the head, no court in England could take cognisance of the act."—Prof. Dicey, "Law of the Constitution," p. 24 (ed. 1897). According to the Trade Disputes Bill (which will probably soon become an Act), "if a union should own a motor-car, and the chauffeur, a servant of the union, should in the course of his employment, through his gross negligence, drive over an innocent wayfarer who has no connection with any trade dispute whatever, and cripple him for life, the sufferer will not be able to recover a penny of damages from the union, even if it possesses £50,000."—Prof. Dicey, *The Times*, November, 1906. Who is King?

BUCKHURST wrote to Queen Elizabeth: "There was never peace well made without a mighty war preceding, and always the sword in hand is the best pen to write the conditions of peace." Lord Roberts said last October: "The surest road to universal peace is the adoption of universal training (in arms)." About the same time President Roosevelt said: "The best way to secure peace is to learn to shoot straight"; and in his recent "message to Congress" he said: "The chance for the settlement of disputes peacefully by arbitration now depends mainly upon the possession by the nations that mean to do right of sufficient armed strength to make their purpose effective." We hear from France that "anti-militarism has not yet assumed sufficient proportions to be regarded as a national peril; but it is generally felt that if allowed to develop with impunity and to proclaim itself in broad daylight, it might before long constitute a very serious danger indeed." The Socialists of Germany were recently discussing the subject of "formally instituting a special propaganda against militarism," but while favourable to a "vigorous local agitation" they could not "saddle the central organisation with a responsibility which might prove fatal to its very existence." Argentina and Chile have appealed to the Christ (see *THE SCHOOL WORLD*, October, 1906). What would He say to the above sentiments?

THE Emperor Napoleon devised various means for securing his autocratic power over the people "whom he loved so well." Among other means he planned assemblies, the upper of which was to discuss Bills or proposals for the amendment of law; the lower was merely to vote a yes or no on them. It will help British folk to understand the working of the Napoleonic constitution if they study the actual working of our "Imperial" Parliament at the present day. It consists of two Houses of almost equal numbers. But the House of Lords rarely meets in anything like full strength, and only a few of its members are anxious to take part in debate. The consequence is that there has never been any need for rules to close

discussion, and speech is there free. The House of Commons, on the other hand, contains many who wish to speak, sometimes even for speaking's sake, and it has been thought necessary to introduce a drastic closure system. It is coming rapidly to be a House for registering votes. Only in committee is there a chance of changing the form of a Bill as drafted by the officials.

WE referred last month to the federation known as the British Empire, and to the difficulties that arise in the relations between the various central and local authorities. A further illustration has arisen since then in the question of admitting natives of India, who are British subjects, into the colonies of South Africa. Meanwhile the United States of America are affording further instances of the difficulties of a federation. Some of our readers will remember a few years ago that the Federal Government found a difficulty in attempting to satisfy the complaints of Italy that some of her citizens were lynched in New Orleans; and now the sovereign State of California (which, however, can by law have no international relations with Powers outside the United States) refuses to teach the children of Japanese within her borders. President Roosevelt finds it necessary to ask Congress to pass an Act "specifically providing" for the occasion, because "the statutes of the United States are entirely inadequate; they fail to give to the national Government sufficiently ample power to protect aliens in the rights secured to them under solemn treaties which are the law of the land." But California will probably not fight: there will not be another civil war.

ITEMS OF INTEREST.

GENERAL.

WE are not concerned in these columns with the incessant discussions on the forms of denominational instruction which may or may not be given in elementary schools. We are disposed to think that in the schools themselves no religious difficulty exists. It is, however, our duty to record that the Government Education Bill, which was introduced in the House of Commons on April 9th last, was, when received by the House of Lords for consideration, subjected to extensive amendment. These amendments were rejected as a whole in the lower House, and the Bill was sent back to the House of Lords for reconsideration, the opportunity being taken to indicate the "concessions" which the Government was willing to make. But the Leader of the Opposition in the House of Lords moved "that this House do insist on its amendments to the Education Bill," and the motion was adopted by a large majority. Thus another opportunity of putting an end to sectarian strife and of concentrating effort on education itself has been lost; and incidentally public interest in the schools has been directed into unprofitable channels.

THE House of Lords has reversed the decision of the Court of Appeal that education authorities are not obliged to make any contribution out of the rates toward the cost of giving denominational instruction in non-provided schools. The effect of this final judgment of what is known as the West Riding case is that a local education authority is obliged to pay for religious education in non-provided, or voluntary, schools.

SIR PHILIP MAGNUS, M.P., has accepted the presidency of the Section of Educational Science of the British Association for the meeting to be held at Leicester at the beginning of August.

MUSIC-MASTERS in secondary schools will be gratified to note that their subject has been deemed worthy of a "memorandum" from the Board of Education. Although the document comprises no more than six pages of matter, some of it irrelevant, and a good deal of it vague and amateurish, still the very fact of its existence has its encouraging aspect to those engaged in the service of the educational Cinderella. The root difficulty is unfortunately outside the sphere of influence of the Board of Education. Secondary schools reflect pretty faithfully the attitude of mind of the public whose children they attempt to educate. So long as the great mass of parents regard the winning of football matches and the compiling of big scores at cricket as more important than the acquisition of an intelligent interest in art, so long will secondary schools continue to encourage the former and discourage the latter. Notwithstanding the pious expression of opinion in the memorandum as to the hardship of taking the time for music out of playtime, the fact remains that the organisation of a school makes it almost necessary that music should be one of the pursuits of leisure; and so long as the practical Philistinism of the British parent demands that the great bulk of schoolboys' so-called leisure shall be occupied with a perpetual round of athletics, so long will schools continue to satisfy that demand. Those who regard a public school as an institution where an individual pupil may acquire a liberal education are in a decreasing minority. There is reason to fear that no number of memoranda from the Board of Education, able and well-intentioned though they may be—and as, indeed, this one is—will do much to remedy the present state of affairs.

FOR many years geography has been an obligatory subject of examination for candidates for admission to the Foreign Office and Diplomatic Services; but under new regulations recently drawn up the examination for these services is to be assimilated to that for the Home and Indian Civil Services conducted by the Civil Service Commission, an examination in which geography is not only not obligatory, but has no place at all. The change will take effect in July next. This step has naturally excited a good deal of comment and no little surprise. A question on the subject was addressed to the Foreign Secretary in the House of Commons; and Sir Edward Grey's reply in defence of the change was that "although a knowledge of geography is no doubt very useful, it is a subject with which men of general education are generally acquainted, and which is easily acquired after entry into the service." Such a reply could not fail to draw forth protests from those interested in geography. In a letter which appeared in the *Times* of November 29th, Sir George Goldie, president of the Royal Geographical Society, directed attention to evidence of the lack of such knowledge among men of general education, and others have done the same thing. Nevertheless, Sir E. Grey, in a subsequent written answer to a question on the subject, maintained his ground, which makes it somewhat remarkable that Mr. Courthope, the First Commissioner of the Civil Service Commission, has taken up a wholly different position, and in a letter to the *Times* (December 6th) expressed the readiness of the Civil Service Commission to welcome geography as a subject of examination, provided that its inclusion can be made consistent with the principles on which the regulations for the Home and Indian Civil Service examinations are framed.

To Sir Edward Grey's contention that geography is a subject easily acquired after entry into the service, Mr.

Mackinder, in a letter which appeared in the *Times* of December 3rd, replies that this is a description of geography twenty years out of date, and cogently urges that "geography has its own modes of thought and its own points of view, which are not to be obtained in a hurry," a claim which has no need to be insisted on with those who have taken any interest in the development of geography in this country within the period to which Mr. Mackinder refers. Mr. Courthope, indeed, does not question this claim, and does not deny the disciplinary value of geography, but bases the exclusion of the subject from the higher examinations conducted by the Civil Service Commission solely on the ground that, in framing the existing scheme of examination, the Commissioners "kept in view the recommendation of Lord Macaulay's Committee that the candidates for the Indian Civil Service are to be chosen by open competition among those who have received the highest liberal education that the country provides," and that, so far, the universities have not given geography such a place as would justify its being included in a scheme so drawn up. The legitimacy of this latter contention has naturally been called in question; but those interested in geography can only hope that one result of the extraordinary step just taken will be to cause still greater efforts to secure adequate recognition for the subject in the universities.

THE interesting ceremony in connection with the formal opening of the additional wing to Cherwell Hall, Oxford, and of the new buildings of Milham Ford School, which is in close connection with the training college at Cherwell Hall, occurred too late to be referred to in our last issue. Mr. Birrell opened the buildings, and his speech was too good to pass unnoticed by us. Secondary education, he said, is not properly provided for in this country. The training of teachers is the principal pulse of the machine. The difference between a good teacher and a bad teacher is known to everybody who has been at school. The skilful teacher is the most valuable and economical asset that the country can lay its hands upon. People grumble about the large sums spent in the education of the children. It will doubtless yet be a larger sum; but the money will be thrown away unless at the same time there can be maintained a race of well-trained teachers. Teachers should try to keep in good health by careful attention to the details of life and to diet; and they ought to get a sufficient number of hours of good natural sleep. Every person engaged in the teaching profession should look forward, and not behind.

DR. SOPHIE BRYANT followed Mr. Birrell with an address on the higher education of women, and gave certain interesting autobiographical details. The *Layman* reports her to have said: "I sometimes say that I was born on the watershed, by which I mean that when I was a little girl I used to help my mother to mend the family stockings, and I was also my father's chosen companion in his intellectual pursuits, so that I have a great deal of sympathy both with the old way of looking at things and with the new way of looking at things." Speaking of the admission of girls in 1863 to the Local examinations of the University of Cambridge, Mrs. Bryant said: "It was not supposed to be proper that our names should be published in the lists, and so we appeared in the lists as numbers only; and I remember perfectly well what were my feelings when a result was published—my place was pretty high—and I was announced only as a certain number! I would so much rather have had my name in print." It is difficult fully to realise how young is the idea of the

education of girls. Yet those who know the work of secondary schools for girls from inside know how completely former conditions have altered. Instead of learning methods of education from men, many schoolmistresses are already leading the way to better and higher ideas.

NOT long after his visit to Oxford Mr. Birrell distributed prizes to the students of Burnley Municipal Technical School, and in a speech referred to the cost of education. He said he could not promise any abatement of the expense of education. The cost will increase; it will be more before it is less. It is not the amount of money we spend on education that grieves the Minister of Education; most nations spend more, and we can afford to spend more; the thing that should cause grief is the amount of money we waste. What we ought to turn our attention to is that dreadful unguarded period between fourteen and eighteen years of age. It is an absolute necessity to maintain unbroken the stream of knowledge so that we do not send into the world uncared for young children of the ages of thirteen and fourteen. One of the chief duties of the Board of Education is to see that public money is not wasted. People who do this class of work can never be popular; but it does not matter whether the Board of Education is found fault with or whether it is cursed—it has the support of all real lovers of education in the country.

IT has been arranged by the Army Council that a special experimental course of commercial and business training for officers shall be commenced at the London School of Economics under Mr. H. J. Mackinder, the director of the school, on January 10th. The course will last for six months, and will be divided into two terms. The object of the training will be to qualify officers for appointments on the administrative staff of the Army and for the charge of departmental services. With this object in view the course will include instruction in accounting and business methods, commercial law (particularly in relation to contracts), transport (by land and sea), statistical methods, economic theory, and economic geography, all these subjects being dealt with from the point of view of the requirements of the Army.

MUCH valuable information concerning the progress of secondary education in England and Wales can be obtained from the recently published Blue-book (Cd. 3255), "Statistics of Public Education in England and Wales, 1904-5-6." The number of secondary schools recognised by the Board of Education for 1905-6 is given as 689, as compared with 575 during 1904-5. It is interesting to note the increasingly large number of schools falling into line with official regulations, and so reaping the advantages of State aid. Though the detailed returns for the year 1905-6 fall outside the scope of the statistics contained in the volume, it is estimated by the Board of Education that the number of pupils taking the approved courses of instruction in recognised schools during that year was approximately 81,370, whereas the number in the preceding year was only 59,848.

THE Blue-book contains full statistics as to the three years preceding the school year ending with the last summer vacation. So far as 1904-5 is concerned, we find that the 575 recognised schools educated 94,698 pupils, and of these 59,848 (including 21,282 girls), as already stated, were studying in accordance with approved four-year courses. There were, in addition, in forms below those taking an approved course, 32,108 pupils, including 11,223

girls; and in classes higher than those comprised in the approved course there were 2,742 pupils—a number which shows that the leaving age at schools recognised by the Board of Education is rarely above sixteen years. Grants were not paid on all the pupils studying in accordance with the approved courses. For various reasons there was a leakage of just over 8,000, and 51,779 pupils secured a grant of £211,254.

We have more than once referred to the arrangements made some time ago by the Board of Education with the French and Prussian Ministries which enabled English teachers of modern languages to be placed in foreign schools, and provided for the appointment of French and German teachers in English schools for periods of one year. The recently published report of the Board of Education (see p. 25) states that the experiment is undoubtedly a successful one. During 1905-6 thirty-one assistants were placed in France—fifteen men and sixteen women; in Germany nine men were appointed; and in this country nineteen French assistants—eight men and eleven women—and two Germans were placed in our secondary schools. The committee appointed by the Board of Education and the French Ministry of Public Instruction also selected thirty-eight young women, many of them previously educated in English secondary schools or universities, to posts as *réditrices* in French training colleges. Until the establishment of the assistant scheme these posts were much sought after by young Englishwomen desiring to qualify themselves to teach French; but the course in an *école normale* is less suited to their purpose than a year's experience in a secondary school, and the standard of attainment in applicants for posts as *réditrices* now shows some falling off. The change in the regulations affecting a third year of study abroad for students in elementary training colleges in England will also affect the character of the supply for these colleges in the near future, and it is possible that the whole question of the *réditrices* may need reconsideration.

THE Canadian Government Emigration Department in London has always undertaken lecture work throughout the country, as well as distributed lantern-slides to those wishing to deliver lectures on Canada. Mr. J. Bruce Walker, the newly appointed assistant superintendent of emigration, has arranged for an official to be attached to the staff for the purpose of delivering lectures on Canada in schools and before societies. Dates are now being booked for lectures during the next few months, and any headmaster or headmistress who desires to secure a lecture should make early application to Mr. Walker at 11 and 12, Charing Cross, London, S.W.

THE London County Council has arranged to hold another conference for teachers in elementary and secondary schools and technical institutes. In consequence of the number of subjects suggested for discussion, the conference will be held on January 3rd, 4th, and 5th, 1907. There will be two meetings on each day from 11 a.m. to 1 p.m., and 2 p.m. to 4 p.m. The meetings will be held at the Medical Examination Hall, Victoria Embankment, W.C. *First Meeting*.—"The Teaching of Modern Languages." Addresses will be delivered by Mr. L. C. von Glehn on "The Direct Method of Teaching Modern Languages," and by Mr. D. L. Savory on "The Application of Phonetics to Modern Language Teaching." *Second Meeting*.—"The Teaching of Shakespeare in the Schools." Addresses by Prof. I. Gollancz on "Shakespeare in the Schools," and by Mr. C. T. Hunt on

"The Teaching of Shakespeare in Elementary Schools." *Third Meeting*.—"Organised Games for Girls." Addresses by Miss M. Lawrence on "Organised Games for Girls," and by Mrs. Kimmins on "Suggestions for Teachers on Organised Games." *Fourth Meeting*.—"Organised Games for Boys." Addresses by Mr. W. Corsie on "Physical Culture in an Elementary School," and by Mr. F. Elston on "Organised Games for Boys." *Fifth Meeting*.—"The Artistic Training of the Craftsman." Addresses on "Book-binding," by Mr. Douglas Cockerell; on "Silversmiths' Work and Jewellery," by Mr. H. Wilson; and on "Printing," by Mr. Emery Walker. *Sixth Meeting*.—"Educational Experiments in Elementary Schools." Addresses by Mr. Marshall Jackman on "An Experiment on Reading and Arithmetic," by Mrs. Shaw on "The Story of Hiawatha in the Infants' School," and by Mr. W. R. Taylor on "The Teaching of Geography." No charge will be made for admission to the conference. Application for tickets of admission should be made to the Chief Inspector, Education Department of the London County Council, Victoria Embankment, W.C.

THE annual meeting of the Geographical Association will be held at the London School of Economics, at 4 p.m., on Friday afternoon, January 4th, when Dr. W. N. Shaw, F.R.S., director of the Meteorological Office, will deliver an address on "Atmospheric Circulation."

THE Education Committee of the London County Council has arranged with the authorities of University College, London, for several courses of lectures for teachers. Among such courses are: "The Seven Ages of Architecture," by Prof. Simpson, beginning on January 15th at 8 p.m.; "The Teaching of Geography to Children," by Prof. L. W. Lyde, on January 17th at 7.30 p.m.; "Some Types of Vegetation and the Conditions under which they Exist," by Dr. Fritsch, on January 17th at 8 p.m.; "The Principles of Electrical Science during the Past 150 Years," by Prof. Trouton, on January 19th at 11 a.m.; and "The Study of German Literature," by Prof. Robertson, on January 19th at 11 a.m.

THE Modern Languages Holiday Courses Committee of the Teachers' Guild has issued a report on the courses arranged for last summer. It appears that forty-two students attended at Tours, sixty-eight at Honfleur, and thirty-six at Neuwied. There were no entries for the Spanish course. Courses, lasting from three to four weeks, will be held in August, 1907, at Tours and Honfleur, in France, and Neuwied am Rhein, in Germany; also at Santander, in Spain, if any entries are received by July 1st. The date of the preliminary meetings at Tours, Honfleur, and Neuwied will be August 2nd, and the courses will begin on August 3rd in the French centres and on August 5th at Neuwied. The representatives of the English committee appointed to attend with the students will be: at Tours, Mr. E. Buck, Christ's Hospital, West Horsham; at Honfleur, Mr. J. V. Saunders, Hymers College, Hull; at Neuwied, Mr. E. Sharwood-Smith, Grammar School, Newbury. A preliminary circular, giving more detailed particulars of arrangements and lists of books to be read in preparation for the courses, will be issued shortly, and the handbook, in which the final arrangements, with full syllabuses of the lectures and lists of householders who will receive students, will be published in May. The courses in each centre will be graduated to suit the relative proficiency of the students. To be able to derive profit from the courses, students should have a fair grammatical knowledge of the language of the country visited, and be able to read its literature with some facility.

ST. ANDREW'S DAY, always a football festival at Eton, was this year made more worth recording than usual by reason of the presentation of various gifts to Dr. Warre. Lord Elgin's speech was worthy of the occasion, and nothing could have been happier than his allusion to the old motto of "Warre's." It has been Dr. Warre's great achievement that the sentiment expressed in the word "Together" has spread over so large an area of Etonians, far larger than the obtrusive band who contribute to the halfpenny Press. An outsider, looking down the list of Eton's headmasters, finds perhaps only one more familiar name. Keate's fame has travelled far, and the years of his forcible rule exceed even the long period of Dr. Warre's headmastership. But Keate would be amazed could he see the buildings of modern Eton, and the organisation which works a school, twice as numerous as in his day, without friction, almost without percussion. Eton has had, perhaps, no greater Head than Dr. Warre, certainly none more beloved.

THE Cambridge Local examinations last month were held at 290 centres in the United Kingdom and the Colonies, the total number of candidates being 16,257. In 1907 and following years the senior, junior, and preliminary examinations will be held in July as well as December. In the Regulations for 1907 several important changes are announced. The natural history of animals has been introduced as a subject for seniors and juniors, and model drawing for preliminary candidates. Changes have been made in the drawing sections for juniors and seniors. A wider choice of subjects than before is allowed in junior English, senior religious knowledge and senior geography, and alternative syllabuses may be offered in experimental science.

THE London County Council has given notice that in the competitive examinations for fourth-class clerkships précis is to be a compulsory subject as well as general knowledge, and the choice of modern languages is to be restricted to French, German, Italian, Spanish, and Portuguese, instead of "any modern language" as at present.

AN open competitive examination for at least ten situations as male sorters in the General Post Office is to be held on February 26th. The last day for making application is February 7th. The age limits are eighteen and twenty-one on February 1st. The remuneration is 18s. a week up to the age of nineteen; then 20s., rising by 2s. 4d. to 44s., with a maximum of 62s. The subjects of examination are: writing, orthography, English composition, arithmetic, and geography.

THE result of the Second Division examination held in October shows that 540 boy clerks competed, of whom one in twelve was successful; while of other candidates one in eleven was successful. The annual rate of appointment to second-division clerkships during the past six years appears to be 300.

SCOTTISH.

THE annual general meeting of the Association of Teachers in Secondary Schools was held in Edinburgh on November 24th. The president, Mr. Thomas Adams, George Watson's College, in his retiring address, said that the conditions under which inspectors in secondary schools carried on their duties were adverse to a true estimate of the teacher's work. They all welcomed the tendency to make inspection more advisory and less dictatorial. But the essential element for the success of the

new method was that the inspector should be a man of wide and varied experience. It was a foregone conclusion that no respect would be shown to the suggestions of men who had only theoretical knowledge, or whose practical experience was confined to two or three years in a secondary school. Mr. Adams welcomed the new bursary scheme of the Secondary Committees. The competitive element was to be largely eliminated, and the financial needs of the parents were to be more carefully studied. Dr. Charles McLeod, Aberdeen Grammar School, was elected president for the ensuing year, and Mr. Charles Dougall, Dollar Institution, vice-president.

SOME time ago the Scotch Education Department issued a circular to school managers in regard to a proposed change in the date of the Leaving Certificate examination, and asked for an expression of opinion as to the advisability of the alteration. It appears, from a communication made by Dr. Struthers, that the replies bring out a remarkable diversity of opinion. Approval and disapproval balance one another almost exactly. In these circumstances it is considered inadvisable to carry into immediate effect the change suggested. The Department is convinced of the educational soundness of the reasons advanced for the change, and anticipates that the force of these will be appreciated by many who were at first adverse to the proposal. Additional representations will be carefully weighed if received before March 15th, 1907.

THE autumn meeting of the Modern Languages Association was held in the history-class room of Edinburgh University. Prof. Kirkpatrick, in the course of an address, referred to the position of Latin as a compulsory subject for a university degree in Arts. Germany and France had already dethroned Latin from its old place of honour, and this country could not afford to lag behind. Nobody disputed the importance of Latin, and its inherent merits would always secure for it plenty of students without any measure of compulsion. In the meantime, he was quite willing to accept Latin on the lower standard as an essential part of the preliminary examination provided it disappeared as a compulsory subject in the Arts curriculum. The action of the Carnegie Trust in insisting upon a pass in higher Latin at the preliminary examination as a condition of the payment of fees was a retrograde step, and pressed very harshly upon lady students. The preferential treatment of Latin had caused a great diminution in the number of students taking German. Unless something was done very soon, German would practically disappear from the school curriculum.

THE Scotch Education Department has resolved to constitute the Northern Highlands a separate division for the purposes of educational administration. The new division comprises the counties of Inverness, Ross, Cromarty, Sutherland, and Caithness. It is felt that the special needs and difficulties of the Highlands necessitate separate treatment. It is also extremely satisfactory to find that the new division has been placed under the charge of Mr. J. L. Robertson, who is given the rank of chief inspector. Mr. Robertson has already rendered notable service to education in the Highlands, and with the freedom he will possess under the new conditions he may be trusted to solve some of the most pressing educational problems in those districts.

PROF. LATTA, of Glasgow University, in the course of an address to the local branch of the Educational Institute, dealt with the university training of teachers. He condemned entirely the present system of combining professional training with university study, and pleaded for a

post-graduate course of practical training. Under the pressure of work entailed by the present system the student teachers lost the main benefits of a university training. The object of a university education was to make students reflect, to make them independent thinkers and inquirers in however limited a degree. By combining professional and academic training this was impossible. The system tended to produce methodised automata instead of liberal-minded students. The present university system of isolated subjects of study instead of correlated groups of subjects served to emphasise the weak points in the university training of teachers. Post-graduate professional training and a five-subject degree course with concentration on two cognate or closely related subjects would give an ideal university training for teachers.

THE scheme for an Edinburgh Art School has at last matured. On condition that a suitable site is provided by the Corporation, the Scotch Education Department will give £30,000 and the Scotch office £10,000 out of the surplus of the Board of Manufactures towards the cost of the building. This will leave a sum of £30,000 to be raised by the municipality or by private subscription, and there is no doubt that this amount will be easily obtained. Edinburgh should therefore soon have an art school in all respects worthy of the capital of Scotland.

PRINCIPAL LAURIE, of the Heriot-Watt College, in an address to the Association of Secondary Teachers contrasted the autonomy enjoyed by the younger English universities with the elaborate restrictions imposed upon Scottish universities. In the former they had full living organisms rapidly developing and adjusting themselves to new conditions and requirements, simply because the responsibility was thrown upon them of governing their own affairs. In the Scottish universities it was taken for granted that the last word had already been said on university education, and the ordinances governing them were framed as if they were to last for ever. He admitted that there was much divergence of view as to what should be the nature of the governing body in each university. Personally, he believed that the main thing was to get self-government, and for this reason he would accept almost any form of governing body rather than that the present condition of affairs should continue.

THE Scotch Education Department has at present under consideration the question of issuing for the guidance of managers and teachers *suggestions* as to the scope and method of treating all the leading subjects of the school curriculum. It is hoped that these suggestions will deal with the subjects on the broad and liberal lines that marked those issued by the English Board of Education. At the same time they should be framed to suit the actual conditions of school life, and especially the restrictions of school time. The ambitious and impossible schemes for geography and history in the English suggestions will, it is hoped, have no counterpart in the Scottish suggestions.

IRISH.

MR. WILLIAM O'BRIEN, the well-known M.P. for Cork, has made an offer of rare generosity which cannot fail to have a far-reaching effect on the university question. Briefly, he proposes on the death of himself and his wife to bequeath his fortune, amounting to £50,000, as a contribution towards the endowment of a Cork university. The Queen's College in Cork would be remodelled into an autonomous university for Munster on a popular, democratic basis, available for all classes. The idea is to

constitute the governing body from the elected representatives of the province, and to make the education cheap enough to attract a large number of students. Mr. O'Brien further suggests a scheme whereby the money should be at once forthcoming. It is that the borough and county councils should forthwith raise the sum from the rates by instalments spread over ten years, the amount being repaid them on the death of himself and his wife. If confined to the city and county of Cork this would not require more than a farthing in the pound, and if spread over the whole province would be less than half a farthing. Needless to say, the scheme is strongly supported by the president, Dr. Windle, and the Lord Mayor and other leading men of Cork.

THIS scheme, if carried through, means two things. First, Queen's College, Cork, would be cut off from the Royal University; and, secondly, it means that the constitution of any other new university in Ireland must be democratic. It does not, however, solve the university question, for a Cork university would not satisfy the Roman Catholic claims for university teaching for the whole of Ireland. In fact, Mr. O'Brien's project is limited to Munster, leaving the needs of the rest of Ireland to be met by another university or university college in Dublin.

MEANWHILE, a committee of Irish Catholic laymen has published in the Press an extract from the statement it has presented to the Royal Commission, which favours the solution of the question by reforming Trinity College. It rejects the plan of a separate university as having been rejected by the previous Royal Commission, as not being justified by the population or circumstances of Ireland, as uneconomical, as not giving Catholics the equality they claim, since a new university could not compare with Trinity, as likely if frankly denominational to strengthen and perpetuate prejudices, and as contrary to the experience of other countries. It objects to a separate college under the Royal University as being a makeshift scheme, and giving only a mere college in a second-rate university. In view of what is called the Dún-raven plan, which the Government was supposed to favour, of a second—a Roman Catholic—college within Dublin University, the committee reiterates its opinion that a reformed Trinity would be more satisfactory, is a reasonable and feasible solution, and would be more likely to pass both Houses of Parliament. The securities for Roman Catholics should be adequate, but a basis of compromise is to be found in the proposals made by certain fellows, ex-fellows, and professors of Trinity College to the present Commission. The bishops, however, are not in favour of this suggestion.

AT one time it appeared that the Commission on the Agricultural and Technical Instruction Department would not be troubled with any criticism by Irish intermediate schools, but it is, after all, a matter of congratulation that members of the consultative committee should have given evidence. The fact is that the work of the Department in secondary schools has given almost complete satisfaction; whatever complaints there are relate to the question of administrative control, about which everyone is agreed that there is serious need of change. It is absurd that there should be two controlling Boards for intermediate schools working on different systems—the Intermediate Board and the Department. The witnesses were Mrs. Thompson, representing the Schoolmistresses' Association; Rev. Wm. Anderson, headmaster of Mountjoy School, of the Teachers' Guild; Rev. P. J. Hennessy, of the Christian

Brothers; Very Rev. Dr. Crehan, of Blackrock College, representing the Catholic headmasters. Their evidence was almost entirely in favour of the work of the Department; there was some criticism as to the length of the programme, and also as to the inadequacy of the grants; on the first point satisfactory explanations were given by Mr. Fletcher, the assistant secretary of the Department; but on the second, no satisfactory explanation can be given, for the grants to intermediate schools from both Boards are altogether inadequate.

THE Board of Technical Instruction under the Department has been taking legal opinion on proposals for making provision for university scholarships in technical instruction schemes, but has been advised that they are illegal. A report on the summer courses for teachers shows that the funds of the Board, for purposes of this nature, are insufficient, and will need to be increased if the courses are to be continued. The Board is also considering proposed arrangements for special courses of instruction for masters and foremen in trade.

THE Irish Society has decided to found a scholarship of the value of £75 a year for three years, tenable at Trinity College, Dublin, by women students from Derry and Coleraine, in which districts its property is situated.

WELSH.

MR. S. J. EVANS in his recent address on Welsh in the county schools states that, in 1903, 16 per cent. of the pupils examined took Welsh, and in 1905 the number was increased to 18 per cent. The French candidates were four times as numerous. In 1903 forty county schools offered Welsh, and ninety-three schools took up French; in 1905 forty-five schools offered Welsh, and ninety-four schools French. Of course, schools vary; and Mr. Evans speaks of one school of 371 pupils all of whom, except twenty-five, have had a thorough and systematic course in Welsh. Mr. Evans mentions one important difficulty. This is "the minimum number of hours for two languages required by the Board of Education to qualify for grants. When schools are unable by scheme, or unwilling, to drop either Latin or French, or make the latter alternative with Welsh, the absolute number of hours available for Latin, French, and Welsh becomes diminished" in each case. Still, Mr. Evans argues that Welsh should be included, as against any language: (1) it has advantages in the teaching of phonetics; (2) its power of forming compounds; (3) its study along with English frees the mind from the tyranny of words; (4) by the Welsh boy the Welsh grammar can be studied inductively; (5) Welsh boys can begin at once on the study of Welsh literature; (6) nineteen out of twenty Welsh boys will have to deal with Welsh people, whereas not one boy in twenty will require French in practical life; (7) Welsh sentiment demands it. We think Mr. Evans has implicitly raised the crucial question, which may be put in this form: Are the school authorities in Wales prepared to substitute Welsh for French in all the county schools of the Principality? If so, a place in the curriculum is easily found—and the scheme for its universal inclusion is practicable, if there is unanimity as to its desirability.

THE demand is made for a separate education code for Wales, and a number of educational authorities have petitioned for this. Others are expected to follow. It is said that Welsh educationists wish to raise the standard, and that by a separate code more account can be taken of the special circumstances o' Wales. It must, however,

be remembered that the inspectors in Wales are almost entirely Welsh. It is possible to alter the code too much—for we can hardly suppose the most ardent of Welsh educationists will wish to suggest any specifically Welsh characters in writing, or new figures for dealing with arithmetic, or some Welsh mode of drawing different from what obtains elsewhere. As to history and geography and the other subjects, there is freedom for the teacher to offer his own syllabus, subject to acceptance from the inspector. This freedom, happily, is open to all teachers in England and Wales, and any change by a Welsh code would only be by restriction of the present freedom of the teachers. Nor has anyone suggested that the Welsh teachers are out of touch with popular sentiment. It does not seem, therefore, that the present difficulty is the code. The chief difficulty to progress is in the staffing, and the improvement of the staffing throughout the country is in the hands of the local educational authorities. Great will be the advantage when the ratepayers insist on improving the staffing, whatever the cost may be.

A DEPUTATION has waited upon Mr. Birrell to urge the compulsory teaching of Welsh in the training colleges of Wales. In the newspaper reports of the preliminary meeting of the members of the deputation it is stated that differences of opinion were expressed on the advisability of asking for compulsory teaching. Of course, the fact is that provision for the teaching of Welsh is made in connection with the day training departments in each of the university colleges, for each college has a professor of Welsh. The only question is: Should every student, or every Welsh student, be required compulsorily to attend the courses in Welsh, and to use such knowledge obtained in his school practice and other training work?

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Laboulaye, Le Château de la Vie. Edited by E. B. le François. 59 pp. (Blackie.) 6d.—This pretty fairy tale is supplied with a brief note on Laboulaye, notes, and a vocabulary which seems to be complete. The notes contain rather too much of what should be left to the teacher. "Look it up in your grammar" is a suggestion which should, and must, emanate from him, not from one who knows nothing of the special needs of the pupils concerned.

Dent's First Spanish Book. By F. R. Robert. 184 pp. (Dent.) 2s. net.—Mr. Robert, whose "Features of French Life" we reviewed on its appearance, has written a First Spanish Book on the lines of the First French and German Books. This method is so well known now that we need not describe it, but only congratulate Mr. Robert on a very successful piece of work. Mr. Symington's illustrations are typically Spanish, and not mere copies of French or German scenes.

Hints on Teaching German. By Walter Rippmann. Third edition, rewritten. 94 pp. (Dent.) 1s. 6d. net.—This well-known companion to Dent's First and Second German Books has been rewritten by its author to correspond with the new editions of those books. Teachers will find it as helpful as before.

Grillparzer, Der arme Spielmann. Edited by W. G. Howard. iv+143 pp. (Heath.) 1s. 6d.—This is perhaps the best short story that the great Austrian dramatist wrote, and it is well that it should be edited. It is, however, hardly the kind of book for young pupils, and the addition of a vocabulary was unnecessary, especially as

all real difficulties are well explained in the notes, which are of more than average quality. A section on the use of the modal auxiliaries and of certain adverbs and particles is well compiled, and should prove useful.

Groszväterchen und Grossmütterchen. By Käte Weber. 38 pp. (Blackie.) 6d.—This is called a *Kinderlustspiel*, and as such may serve its purpose. It is, however, a little foolish; especially the character of the bluestocking is grotesque, and therefore hardly suitable for representation by a child. The dialogue is animated, and contains many useful phrases.

F. Gerstäcker, Irrfahrten. Edited by F. B. Sturm. iv+203 pp. (Heath.) 1s. 6d.—There is a commendably brief introduction, without any of the grand talk which American editors too often think it necessary to inflict. The story is good fun; the notes are satisfactory, and the vocabulary is practically complete. This forms a welcome addition to the small number of humorous readers for intermediate classes in German.

Classics.

A Grammar of Classical Latin, for Use in Schools and Colleges. By Arthur Sloman. xvi+480 pp. (Cambridge University Press.) 6s.—It is to be feared that this book will fall between two stools. It is too big for the schoolboy, and not complete enough for the advanced student. The student will still go to Roby and Draeger and other works of that sort; while the schoolboy wants something of a different kind. Moreover, since this is a grammar of "classical Latin," it is of no use for the student of historical grammar: the origin and growth of forms and usages cannot be dealt with when Plautus and the early writers are outside the scope of the work. In the Accidence, we note with regret that the marking of quantities is not scientifically done. In grammars, at least in those meant for any but the advanced student, all vowels long by nature should be marked; the absence of a mark would then imply short quantity. What is the use of adding the short mark, which only disfigures the text? And more—in this book, the long vowels are not always marked even in the early pages. In pp. 1-105, the editor tells us, "all quantities which could possibly be doubtful have been marked." But the learner, who is generally careless, cannot be depended on to know the quantities unmarked, e.g., in *sīnū ullo mīlītū* (p. 102). It is less trouble, more accurate, and more instructive to adopt the rule we have suggested and write *sīne ullō milite*. So also we see *quid nēgōti* (p. 100), *hi hōs* in the declension of *hic* (p. 95) and so forth. After p. 105, only occasional markings are used, e.g., to indicate concealed quantity. We should also direct attention to the description of the vowel sounds on p. 5, which is unscientific: *ā* is not sounded as in English, *fat*, but as in German *hat*; nor is *ē* a diphthong ("aim"), nor *ō* the sound heard in *foal*, nor *ī* that of *sit*.

In the Syntax, we are glad to see the Construction according to Sense and Agreement according to Position or Attraction more fully dealt with than in most grammars (p. 235 ff.). Mr. Sloman is also clear and good on the construction of compound verbs, and verbs with more than one construction (p. 264 ff.). His whole scheme of case-constructions is good, and presents itself clearly to the eye on the page as well as to the memory. A section on the rhythm of clause-ends (p. 387) is a welcome addition; and that on Prosody is full. The latter part of the book—Syntax, &c.—seems to us to be distinctly the best; and there is some originality in its arrangement. We do not like the print or the page; it tries the eyes somewhat to read, and the margin is so small that they are dazzled

by the general impression. Nor has the printer realised how important it is to get as much as possible of a paradigm upon one page or double-page, so as to be before the eye all at once.

Selections from Plutarch's Life of Caesar. By R. L. A. du Pontet. iv+107 pp. (Clarendon Press.) 2s.—In this book, sixty-four paragraphs of about eighteen lines each are extracted from the Life, and arranged so as to suit "young boys beginning Greek." Compound verbs and augmented forms are split up by hyphens, and a few simple notes are added. The book will be a welcome addition to the number of those suitable for beginners, and may well be stimulating, as the editor found, when read with Caesar's "Commentaries" and Shakespeare's "Julius Caesar."

Plutarch's Coriolanus. Edited with Introduction and Notes. iv+70 pp. (Clarendon Press.) 2s.—This book is meant for more advanced students, and calls for no special remark, except an expression of satisfaction that Plutarch is beginning to be read again. The notes are useful and good, and for Plutarch notes are often necessary.

Latin Unseen. Selected and arranged by E. C. Marchant. iv+78 pp. (Bell.) 1s.—These "Unseen" range from single sentences, in which we are told, e.g., that "Caesar when he came there demanded hostages, arms, and slaves," to paragraphs of fifteen or twenty lines. The book is a kind of Latin *Tit-Bits*. We hope that when the teaching of Latin is reformed in this country there will be no room for such books in the earlier years of the work; and for the later years it is too easy. We cannot see the use of it. Those who like this kind of book will, however, find it easy.

We may mention, for those who may use such books, a *Latin Vocabulary* "in use in the Junior Forms of Leeds Grammar School," compiled by A. C. Price and C. Norwood. 19 pp. (Blackie.) 4d.—But to learn lists of words by heart! We had hoped that this method was disappearing.

English.

England in the XVIth Century. By Raphael Holinshead. 127 pp. *The Complete Angler.* By Izaak Walton. 120 pp. *Captain Cook's Second Voyage.* 128 pp. (Blackie.) 6d. each.—Dr. Rouse never fails to select interesting books for this cheap, and handy, and attractive series. We cordially commend these last three additions to it, which are perhaps none the worse for not being burdened with annotations. Very brief introductions are prefixed in each case, as usual.

W. C. Perry's The Boy's Odyssey. By T. S. Peppin. xx+211 pp. 1s. 6d. *Select Scenes and Passages from the Historical Plays of Shakespeare.* By C. H. Spence. xi+70 pp. 10d. (Macmillan.)—These are intended for secondary-school use, and are well edited. The idea of using Mr. Walter Copland Perry's book as a reader is distinctly good, and Mr. Peppin's introduction is capital. All the usual valuable features of this excellent series are reproduced in these editions, which may be safely commended as highly interesting matter for literature classes.

Childe Harold's Pilgrimage. Cantos III. and IV. By J. H. Fowler. xiv+136 pp. (Macmillan.) 1s. net.—Besides the glossaries and notes to each canto, this capital little edition contains some well-considered questions, subjects for essays, suggestions for paraphrase, and also of

passages suitable for repetition. It will be seen at once that all the necessary material for a useful manual has been collected in these pages. The helps to further study also are worthy of great attention, and, carefully used by a teacher, may be made serviceable in enlarging the grasp of younger minds upon these cantos of Byron's poem. Altogether and in every way commendable.

Goldsmith's Traveller and Deserter Village. *Gray's Elegy.* *Coleridge's Ancient Mariner.* *Wordsworth's Simpler Poems.* (Dent.) 1s. net.—In this little volume four smaller editions of these favourite works are bound together with introductions, notes, and glossaries. The volume is elegant and useful.

History.

Syllabus of British History. Parts VI.-IX. By C. H. K. Marten. 16+18+18+21 pp. (Eton College: Spottiswoode.) 6s. net.—These are the four parts now published of a ten-part syllabus, bound together in one quarto volume, printed on one side of the paper only, leaving the other for note-taking. Mr. Marten's idea is to give teacher and pupils a syllabus, illustrated with genealogical tables and quotations from the best historians, of all British history. These four cover the periods from 1845 to 1815. They will be exceedingly useful to the earnest teacher who proceeds *viva voce* with his history lessons. Many of the topics are hinted at in the form of problem questions. The main stream of English history is followed first, and then follow "special subjects," such as Scotland, religion, literature, and so on.

Outlines of Nineteenth-century History. By P. V. N. Myers. v+138 pp. (Ginn.) 2s. 6d.—"At the request of teachers who desire to use those chapters of my revised 'Medieval and Modern History' which cover nineteenth-century events after 1815, they are here bound separately," and make a little book complete in itself, with index, maps, &c.

Illustrative History. Medieval Period. By A. Kimpster and G. Home. xxviii+246 pp. (Horace Marshall.) 2s. 6d.—This contains between seventy and eighty extracts illustrative of English history, drawn mainly from contemporary documents, but partly also from later sources of literary value, such as Shakespeare and Scott, translated where necessary into modern English. The book should be in the hands of all teachers, if not of their pupils. The pictorial illustrations are good, but leave something to be desired. The facsimile from Domesday book is readable under a magnifying glass, but that of Magna Carta does not prove legible even with that help, and we could always wish, with these and similar illustrations, that at least a transcription could be added of the mediæval words. We could also wish that more criticism of the extracts could be given than is afforded in the general account of the authorities given in the "analysis of sources." Otherwise, the unlearned are apt to take these extracts as "gospel" truth. But perhaps this would increase the size of the book beyond desirability.

Outlines of British History, 1017-1870. By M. E. Carter. xiv+395 pp. (Clive.) 2s. 6d.—This is a good working history of England on the usual lines. It is not quite so much up to date in some minor matters as the preface leads us to expect, but, on the other hand, the eighteenth century is better and more fully treated than is generally the case. Each "book" is prefaced by a retrospect and a forecast. There are genealogical tables, lists of contemporary sovereigns, chronologies, and an

index. The last fifty pages are occupied with a sketch of the outlines of European history during the period covered by the main portion of the volume.

Heroes of European History. By L. Creighton. xii+196 pp. (Longmans.) 1s. 6d.—Mrs. Creighton here treats the whole of European history in an interesting way, making her story to revolve mainly, and as far as possible, round the careers of the great men of history. There are chapters on Greek and Roman story, on the Middle Ages and Modern History. There are many good illustrations and seven maps. It is a book which we should recommend as a first introduction for school children to that history of Europe which is so desirable, and for which materials are now being rapidly provided.

The Records of Southampton. By F. J. C. Hearnshaw. 24 pp. (Southampton: Cox and Sharland.) 1s. net.—Prof. Hearnshaw gives an interesting account of some of the borough documents, some of which have been published, with a view to interest the Southampton folk and others in the wealth at their disposal, and to induce them to help in further reprints. Would that other towns would do the same or similar work!

Geography.

Philips' Model Duplex Maps. (Philip.) 1d. each.—This is a series of sixteen double-page maps, each complete in itself, and printed on stout paper hinged with canvas. The covers are utilised for lists of geographical names and facts, at the end of which are inserted a few questions by way of examination. The maps comprise the continents and those regions of the world which are of the most importance, politically speaking. In each case a relief map faces its political or physical counterpart; both are similar to those reviewed in THE SCHOOL WORLD for August, 1906 ("Philips' Model Atlas"), p. 314. They should be suitable for class-work, as they are easy to hold and of a convenient size, while the "lists" and "facts" make a good nucleus for oral teaching. We note that several names on the covers do not appear in the maps, and that, though the spelling on cover and map usually agree, there are exceptions. Nevertheless, a wonderful pennyworth!

Philips' Model Atlas. 1s.—This is the same book—with the addition of a twelve-page index and an extra 6d. on to the price—that we have already reviewed in these columns. The index is, of course, a great improvement, and as the places are referred to in the proper way, viz., by means of their latitude and longitude—and not, after the fashion of some of the modern atlases, by the arbitrary system of combined letters and figures—the educational gain is great. The book is good value for the money, and suitable for junior forms.

Atlas of the World's Commerce. Edited by J. G. Bartholomew. To be completed in 22 parts at 6d. each part.—This publication is pursuing the even tenor of its way, and had reached Parts 10 and 11 by the middle of October. It is quite good, and quite invaluable to students of commercial geography. Part 10 comprises—in addition to Mr. Taylor's instructive gazetteer of commodities (Slo. to Tur.)—a diagram of British import and export tables, and maps dealing with the general commerce of Europe, the Near East and the Far East, and the chief industrial districts of China, Japan, Egypt, West Europe, and West Africa. In addition to what one would ordinarily expect in a commercial map, three features strike us as particularly prominent in this Part 10: (i) The base colours in the general maps show the distribution of vegetation

(forest, prairie, desert), and are therefore much more satisfactory than any arrangement of labels superimposed on a political background; (ii) the navigable qualities of the rivers are strongly indicated; (iii) the regions of greatest cultivation, as shown in the maps of the more undeveloped countries, are very striking. "The Nile is Egypt and Egypt is the Nile" becomes an illustrated truism under this treatment. Part II concludes the gazetteer, and contains an interesting article on the "Development of New Lands," and statistical diagrams and maps of the distribution of food fishes, maize, rye, oats, rice, manioc, and potatoes.

Arnold's Home and Abroad Readers. Book IIIa. The British Isles. 224 pp. (Arnold.) 1s. 6d.—This is a supplementary volume to a well-known series, and should be read in conjunction with its companion books, IIIa. of Arnold's "Steps to Literature" and "Gateways to History," both of which deal with the British Isles. It is divided into seven parts, the last of which (fifteen pages) affords "glimpses" of Greater Britain. The illustrations, though small, are good; Frith and Valentine, as is right, have been largely drawn upon. The book is interesting, and, for those who like to teach geography *via* readers, to be recommended.

Kent. 128 pp.; maps and illustrations. (Blackie.) 8d.—Preceding volumes in this county series of "Supplementary Readers" deal with the counties of the upper Thames, the Midlands, Surrey, Middlesex, Yorkshire, Cumberland, and Westmorland. The treatment of the subject is on the same lines in all: physical geography, history, interesting towns and industries, roads and railways, plants and animals, notorieties, and many other items have chapters assigned to them. The language used is direct and simple, well adapted for junior forms. The aim proposed is to quicken interest in nature-study and geography, more particularly, of course, that of the immediate surroundings in the various counties. A short synopsis at the end drives home the lessons of the book. Here and there in "Kent" description tends to become catalogue, and there is no orographical map. But it is very readable, and should serve its purpose in the schools of the county.

Mathematics.

Examples and Homework in Preliminary Practical Mathematics. By T. I. Cowlishaw. 53 pp. (Longmans.) 1s.—The primary object of this book is to secure uniformity of instruction and homework in preliminary classes in practical mathematics conducted by several teachers in one institution. There are twenty-five sets of questions, each set consisting of a number of examples to be worked in class and of a smaller number to be worked at home; alternate pages are left blank, and are intended for notes to be made by the student. Though there is a certain element of value in the idea of securing uniformity of instruction, there seems to us to be some disadvantages in the method here proposed for securing it. The examples themselves, however, are usually very suitable for the particular type of pupils for whom they have been drawn up, but those of set XIII. do not seem to us to be in place in an elementary collection, and there seems to be a deficiency of examples of a geometrical character. The course is meant to provide a year's work.

A Second Geometry Book. By J. G. Hamilton and F. Kettle. viii+292 pp. (Arnold.) 3s. 6d.—The method adopted by the writers of this volume in their "First Geometry Book" is well known to teachers; this larger

work has been constructed on the same principles, and possesses the same characteristics. Pupils who faithfully carry out the instructions laid down should, we think, obtain a sound knowledge of elementary geometry. Our only hesitation arises from a feeling that the method, good in itself, is perhaps carried too far. A method suited for beginners is not necessarily suited for more mature pupils, and we are inclined to think that a closer approach to the Euclidean tradition might be made as the pupil's knowledge of geometrical facts and power of reasoning about them are increased. At the same time, we do not wish to press a personal judgment too far, and we gladly recognise the great merits of the book.

Algebra for Beginners. By William Dodds. 188+ (Answers) 60 pp. (Murby.) 1s. 6d.—The author of this work has doubtless spent much labour on its production; he states rules clearly, and provides a large number of simple exercises and sets of examination papers. At the same time, we cannot refrain from stating that we do not think the book to be at all a satisfactory exposition of algebra, and that we should be sorry to see the teaching of algebra carried out on the lines here laid down.

Tables and Problems. Compiled and arranged by Thomas Fatkin. 62 pp. (Leeds: John R. Wildman.) Paper covers, 1s. 6d. net.—The complete title contains, in addition, the words: "With Formulae and Solutions for ascertaining the annual payments required to provide assurances for life, endowment assurances, temporary assurances, immediate and deferred annuities, superannuation, old age pensions, &c.," and is perhaps sufficiently descriptive of the contents. The book is evidently written by one who is not a teacher, but is perhaps all the more valuable on that account as representing the attitude of practical men of business. There is, we think, another side to the question of what ought to be taught in school than that so strongly emphasised in this pamphlet, but there is also no doubt at all in our own mind that every teacher who has to deal with annuities would profit by a study of the pamphlet. The criticism of the terms given under "The Elementary School Teachers' (Superannuation) Act" should be of special interest to teachers.

A Rhythmic Approach to Mathematics. By Edith L. Somervell. With a Preface by Mary Everest Boole. 67 pp. (Philip.) 2s. 6d. net.

Boole Curve-sewing Cards. Series II. (Same publisher.) 8d. net.

The approach here described lies through the construction of curves as envelopes of straight lines, the straight lines being formed by threads sewed on cards; the diagrams in the book show a large number of interesting patterns produced by simple means that are well within the powers of children who can use a needle. In a very interesting preface Mrs. Boole gives a short sketch of the origin and purpose of this method of evoking the geometric instinct, and we think that even old-fashioned teachers must admit that there are great possibilities in the method; it gives results that are so suggestive that a child who is left to do as much as possible for himself cannot fail to gain geometric ideas that will be of great value at a later stage. Even if the geometric fruit were not abundant, the exercises would be thoroughly interesting and sensible.

Rapid Methods in Arithmetic. By John Johnston. 87 pp. (Pitman.) 1s. net.—This little book is said to be "designed for the use of the commercial student and the business man," and is introduced by a preface which contains much

good advice. If pupils could be induced to give the constant practice which is stated to be necessary for acquiring dexterity there would be no great need for a special book on rapid methods, but the real difficulty is to get pupils to submit themselves to the discipline. Many of the rules contained in the book are, though well known, quite important enough to deserve special notice; others, again, will only be required in particular lines of business. The book may prove to be useful for some types of pupil, but we do not see that it offers any decided advantage over the many text-books that provide ample opportunities for that drill which it is the special object of this work to inculcate.

Elementary Algebra. By G. A. Wentworth. x+421 pp. (Ginn.) 5s.—In the treatment of his subject, the author does not depart so widely from the traditional order and content as do several of the recent writers of text-books. Graphical work is introduced, but the amount of it is comparatively small. Yet the book has decided merits: the illustrations of the passage from arithmetic to algebra are simple and clear, the selections of examples that are used to explain the various rules and processes are usually excellent, and attention is given to the orderly development of algebraic principles. The range of the book includes the binomial theorem, logarithms, simple limit theorems, and first notions of convergency of series. There are large numbers of exercises, but no answers, though these may be obtained without charge by teachers on application to the publishers.

Science and Technology.

The School Magnetism and Electricity. By R. H. Jude. 403 pp. (Clive.) 3s. 6d.—This book is an extension of Dr. Jude's "First Stage Magnetism and Electricity." In Part I. (Electrostatics) the idea of potential is introduced at an early stage by analogy to an indiarubber air-bag; the more scientific conception of potential being deferred to a final chapter on the mathematical aspects of electrostatics. In Parts II. and III. (Magnetism and Electrodynamics), as much stress as space would permit has been laid upon subjects of importance to the young electrical engineer, such as magnetic flux and permeability, potential-drop, work and horse-power in a circuit, storage cells, and electromagnetic induction. The subject-matter is treated in a satisfactory manner, and the numerous examples worked out in the text add considerably to the utility of the volume. We should have preferred to see a more scientific statement of Ohm's law on p. 276; also, the size of the volume might be expected to afford a more complete explanation of the chemical action of an electric current than that based upon the hypothesis of Grotthüs.

A First Course in Physics. By R. A. Millikan and H. G. Gale. 488 pp. (Ginn.) 7s. 6d.—The course presented in this book has grown out of the actual needs of the elementary work in physics in the University of Chicago, and its most characteristic features have been on trial for three or four years in numerous secondary schools in various parts of the United States. All branches of physics are treated in a non-mathematical manner, and the numerous and clear illustrations render the book attractive to the beginner. Two chapters, on molecular motions and molecular forces, are worthy of special mention; in them we find the relationship of the more important properties of matter set forth in a very clear manner. The authors are to be commended for limiting the range of subject discussed, and for devoting much space to a description of applications of first principles. The portraits

of sixteen of the great makers of physics have been inserted for the sake of adding human and historic interest to the text.

Theoretical and Practical Mechanics and Physics. By A. H. Mackenzie. 112 pp. (Macmillan.) 1s.—Education authorities are endeavouring, in many districts, to organise for artisans suitable evening courses extending over a period of three or four years. In a scheme which has recently been brought into operation in the Leeds district, the syllabus for the first and second year includes experimental mathematics, mechanics and physics, and English. This book has been prepared to meet the requirements of the mechanics and physics course; it is also applicable to the same course in day preparatory trade schools. The author is evidently well acquainted with the requirements, and the average attainments, of artisan students, and the volume will be found serviceable in schools of the above nature. The contents are divided into seven chapters, on length and area, volume, mass and weight, density, hydrostatics, statics, and heat. The diagrams and type are excellent, and the volume is marvelously cheap.

Church's Laboratory Guide. Revised and partly rewritten by Edward Kinch. xvi+349 pp. Eighth edition. (Gurney and Jackson.) 6s. 6d. net.—A book which has reached an eighth edition needs no commendation from us. In its revised form the volume should become still more popular than it has been. We have little doubt it will continue to be a favourite text-book in agricultural schools and colleges—for the students of which it is particularly intended—and to be consulted widely by agricultural chemists.

Miscellaneous.

Who's Who, 1907. xviii+1958 pp. (Black.) 10s. net. *Who's Who Year-book, 1907.* vii+148 pp. (Black.) 1s. net.—There is a great deal that will interest teachers in this extensive collection of autobiographies. An honourable place is given to distinguished educationists. University professors, schoolmasters, schoolmistresses, writers on educational subjects, and educational administrators are all well represented in the volume. It is clear, in fact, that the editor attaches great importance to successful work in education in deciding which persons are sufficiently important to be included in his gallery of distinguished men and women. There is an unfortunate want of uniformity in the amount of information provided about different persons. We are told too little about many interesting persons and too much concerning other celebrities. The editor might with advantage do more "editing" in preparing the next edition. The "Who's Who Year-book" contains useful and exhaustive lists of facts about the Press, officials, clubs, societies, and so on, which were bound up originally with "Who's Who."

Highways and Byways in Berkshire. By J. E. Vincent. With Illustrations by F. L. Griggs. xiii+443 pp.; 3 maps. (Macmillan.) 6s.—Every teacher of geography and history in Berkshire should read this book, both for his own sake and that of his pupils. Of all the volumes in the series to which the book belongs, we remember none from which so much material can be obtained to give life to the geography and history lessons. As a pleasant companion for the resident or the wayfarer in Berkshire, the volume will be sure of a welcome within the limits of the county, and as an addition to the libraries of common-room and school it claims a place. For some 100 miles of its course—from Lechdale to Old Windsor—the Thames with the Isis forms

the upper boundary of Berkshire; and it would have been easy to devote a volume to this great highway alone, which formed the frontier of the country of the Atrebates, who were the original Berkshire folk, and kept back the Dobuni barbarians of the north. Mr. Vincent has much to say of interest concerning the historical and literary associations in which the county is so wealthy, and he glances sympathetically at prominent points of its natural history. He is an ideal guide, with an eye for essentials, a cultured mind, and a fine feeling that prevents him from descending to prolixity. A county is fortunate when its places and people are sketched in the spirit manifest both in the text and illustrations of this volume.

The World's Calendar. Invented by the Rev. J. P. Wiles. (Philip.) 2s. net.—This is an ingenious perpetual calendar which should be of service to historians in determining easily the day of the week corresponding to particular dates or *vice versa*, and to everyone who is at any time concerned with chronological studies. By a simple device of movable dials, the calendar can be set to form an almanac for any year (either for the old or the new style of reckoning), Easter Day can be found from A.D. 1 to A.D. 2199, and dates of all new moons from A.D. 1900 to A.D. 2199. We have tested the calendar for a number of dates and have found it accurate. The date of Easter Day in 1905 provided a good test of the Easter dial. According to the Prayer Book, "Easter Day is always the First Sunday after the Full Moon, which happens upon, or next after the Twenty-first day of March." In 1905 there was a full moon on Tuesday, March 21st, and it might have been supposed that Easter Day would have been on Sunday, March 26th. Easter Day did not come, however, until April 23rd, which is the date correctly shown by Mr. Wiles's calendar. An ecclesiastical full moon is used to determine the date of Easter, and not the actual full phase of our satellite, and this may have accounted for the date in 1905, or the fact that the time of full moon was 4.56 a.m.; but, in any case, the calendar is found to respond faithfully to the inquiry made. Mr. Wiles is to be congratulated upon inventing a clever contrivance, and the publishers upon the tasteful style in which they have produced it.

Education and Ethics and other Essays on Educational Subjects. By Arnold W. Smith. 77 pp. (Bourneville: St. George Press, Ltd.) 2s. net.—Though Mr. Smith has little that is new to say, his essays should serve as an inspiration to the young teacher, leading him to resolve to strive anew after high ideals. We are unable to agree with Mr. Smith that geography is comparatively valueless as a school subject, and we think that there are better ways of teaching it than those he outlines in his chapter on "The Conflict of Studies." The essays are, however, decidedly worth reading.

Sir Joshua Fitch. By A. L. Lilley. 263 pp. (Edward Arnold.) 7s. 6d.—This account of the life and work of a distinguished and good man was well worth writing, and, making allowance for the sometimes unqualified judgments of personal affection, has been written well. Fitch's career was really a compendium of English education for the whole of the last half of the nineteenth century, and not of "elementary" education only. The affectations, and the perhaps necessary official definitions, which separate "elementary" from "secondary" and "university" education are shown to be artificial and accidental by nothing so clearly as by the constant part which Fitch took, and took effectively, in regulating all grades. For though he

was by official preoccupation and by most intimate personal experience qualified as none other was to speak for primary schools, his wise help was sought in all the crises that arose in the educational life of the country.

To review adequately such a book as this, another book should be written. The reviewer looks at the marked passages, and would like to dwell on Fitch's wise and hopeful view of professional associations; on such apparently little things as "reading aloud," and such large things as the selection of teachers; on his warning against the vagaries of "kindergarten," the abolition of school fees, excessive decentralisation, and so forth. On these, as on so many other matters, experience has amply demonstrated the accuracy of his forecasts.

With less satisfaction, perhaps we may remember his unwillingness to admit the facts of over-pressure, though we remember with less still the vulgar denunciations to which he was subjected in certain quarters for his honest opinions. In the "teaching" of English literature his excessive appreciation of the knowledge of "meanings" and the worrying of the text are influences from which we have yet to emancipate ourselves, as also his cherished view that "the principal duty of a modern University was to measure results."

For the rest, he was a fine example of the English public official, scrupulous in the discharge of his duty, frank in the expression of his views to those whom they concerned, loyal to his office, his colleagues, and his chiefs, actually and retrospectively, silent in the face of detraction, and a model comrade, as younger men will remember. He was not so simple as his biographer would sometimes appear to think. His dovelike manner concealed not a little of the serpent's wisdom; and he did not always display his whole case. But he was moderate and just. It was this that made him always ready to admit that there were perhaps two valid opinions on any matter—even on the "detested" Boer war; and he would shout on no side. Mr. Lilley's book will do much to keep his admirable memory green.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Binomial Cube.

THE model known as the binomial cube is not a new invention. It is, however, little known to teachers, and is rarely used in schools, although most helpful in explaining cube root and the factors of cubic expressions.

Recently, when visiting a school, I proposed as an exercise for a woodwork class the making of binomial cubes. The exercise not only provided a good test of accurate planing and sawing, but aroused so much interest among the boys that I think a few notes on the subject may be of use to teachers both of woodwork and mathematics.

As its name implies, the model represents the expansion of a binomial expression to the third power—

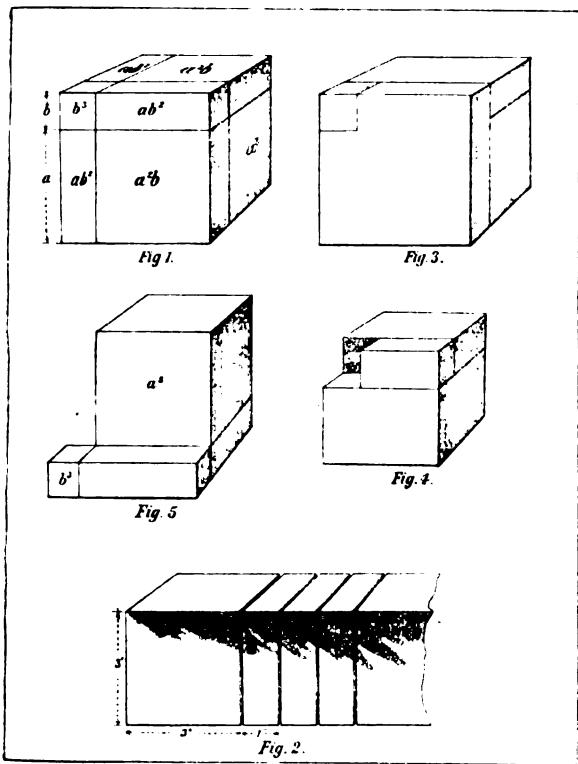
$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3.$$

Each term of the expansion being of the third degree can be represented by a solid: a^3 and b^3 are represented by cubes of edge a and b respectively; the expression $3a^2b$ is represented by three square prisms, each having a square

base of side a and a length denoted by b , while the expression $3ab^2$ is represented by three prisms of length a and cross section b^2 .

Hence the whole model consists of eight blocks which fit together, forming a cube the edge of which is $(a+b)$ (Fig. 1). It will be seen that four of the blocks have the same cross section a^2 , while the other four have a cross section b^2 . Hence it is an easy matter to make the model in the workshop, since it is only necessary to plane up two square prisms and saw off blocks of the required length ($3''$ and $1''$ are convenient sizes for the edges of the prisms) from each (Fig. 2).

As a boy cannot plane a short piece of wood satisfactorily, it will be found convenient to make the prisms



of such a length that two sets of blocks can be sawn from each.

Useful as is the model for demonstration purposes, its value is vastly increased when each boy has one of his own making which he can take home and study at leisure. If a boy spends half an hour playing with such a model he will probably have a clearer idea of the difference between a coefficient and an index than would result from a day's talking.

By simple manipulation the model can be used to illustrate the identities

$$\begin{aligned} (a-b)^3 &= a^3 - 3a^2b + 3ab^2 - b^3 \\ a^3 + b^3 &= (a+b)(a^2 - ab + b^2) \\ a^3 - b^3 &= (a-b)(a^2 + ab + b^2). \end{aligned}$$

With a little practice a boy can visualise the geometric forms of these expressions, and he will afterwards have no difficulty in remembering them.

Wood and labour being cheap, it may be interesting to cut a few special blocks to illustrate these identities more

simply. Instead of dividing the whole cube of Fig. 1 into eight blocks, it can be cut into five blocks, as in Fig. 3, from which we get at once, according as the side of the cube represents $(a+b)$ or a —

$$\begin{aligned} (a+b)^3 &= a^3 + 3(a+b)ab + b^3 \\ (a-b)^3 &= a^3 - 3(a-b)ab - b^3. \end{aligned}$$

Fig. 3 gives perhaps the simplest geometrical representation of the value of $(a-b)^3$. By algebra—

$$a^3 - 3(a-b)ab - b^3 = a^3 - 3a^2b + 3ab^2 - b^3.$$

A comparison of these two expressions with their geometrical equivalents will help to give a boy a clear notion of the process of removing brackets. It will then be interesting to write out the value of $(a-b)^3$ as represented by the separate blocks of Fig. 1, viz.:

$$(a-b)^3 = a^3 - 3(a-b)^2b - 3(a-b)b^2 - b^3,$$

and to trace geometrically the steps by which this is reduced algebraically to the form

$$a^3 - 3a^2b + 3ab^2 - b^3.$$

The factors of $(a^3 - b^3)$ are obtained at once from the model shown in Fig. 4, where a small cube of side b is cut out of a cube of side a .

The remaining portion divides into three blocks, the dimensions of which are:

$$\begin{aligned} (a-b) \times a \times a \\ (a-b) \times a \times b \\ (a-b) \times b \times b \end{aligned}$$

or

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2).$$

The factors of $(a^3 + b^3)$ are represented most directly by Fig. 5, where the value of $a^3 + b^3$ is obtained by subtracting the block represented by $(a+b) \times a \times b$ from the sum of the two prisms $(a+b)a^2$ and $(a+b)b^2$, or

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2).$$

Chester.

ARTHUR DUFTON.

The Worship of the Diagram.

MR. WARREN'S paper in your December issue is on a subject that has demanded attention for some time; examiners and examining bodies seem to have set up as their idol an accurate drawing, and, like other idol-makers, they will only be satisfied when everyone falls down to worship. Moreover, geometry is not the only subject to suffer, for worship is expected to a great extent in chemistry and in physics as well. It is surely a sign of the times that an enterprising firm of instrument-makers has placed on the market a special piece of apparatus to make accurate drawing merely mechanical.

So far as geometry is concerned, a proof of a theorem with an inaccurate figure is, to my mind, worth more than a proof with an accurate figure, while a proof without a figure would be still more valuable. Geometry deals with points, straight lines, plane surfaces, and other things of a like nature which exist only in our imagination, and cannot be accurately drawn. A proof is an exercise in logical reasoning, and a figure is an adventitious aid to our weak imaginations: a figure, as accurately drawn as it can be, is a greater aid than an inaccurate one, and betrays greater weakness in reasoning power. Instruments should be abandoned as soon as possible, and the figure drawn as accurately as may be by hand only, spending as little time on it as one would usually spend on some-

thing which is not essential to the end in view, but merely a crutch to help us on our way.

Physics and, more particularly, chemistry are treated in the same way as geometry. It is often printed at the head of a paper that accurate drawings of any apparatus described are required; occasionally questions are set which can be completely answered by a drawing alone; while in reports on the papers sent in the drawings receive an undue amount of attention, especially with regard to proportion and form. Such questions as those mentioned are surely out of place in a paper on chemistry: they could almost be relegated to a paper on drawing, while a strictly accurate drawing is not essential to a good account of an experiment.

That a drawing of the apparatus used in any experiment very much improves the account of the experiment must be admitted, and admitted ungrudgingly. It saves a good deal of writing, and renders the arrangement of the apparatus intelligible at a glance. But why should a lot of time be spent on making a drawing accurate in proportion or form either in an examination paper or in a laboratory note-book? The real reason why a drawing should be made in a laboratory note-book is that it serves to record the exact way in which the apparatus was arranged and the kind of apparatus that was used. These are the two points that a drawing should bring out clearly, so that if, at any future time, the same kind of apparatus is required, the method of setting it up can be quickly seen. Surely a drawing correct in perspective, proportion, and form is not required for this purpose: a diagram consisting of straight lines would almost be sufficient from the point of view of form; while if a beaker did happen to be out of proportion compared with the rest of the apparatus, the experimenter would hardly be likely to hunt for a bucket in mistake.

As a rule, the time devoted to science is small enough, and it should be devoted entirely to teaching the methods by which the facts of the science are acquired. Time spent in the laboratory in producing elaborately accurate drawings is wasted. So long as the drawing gives a clear idea of the apparatus to those who are accustomed to deal with it, all that can be rationally demanded has been done.

To return to examinations: it is surely unjust to those boys who cannot draw to assign any marks to drawings in a paper on chemistry. Their knowledge of the facts and methods of chemistry may be sufficient to answer the questions set in a satisfactory manner; their drawings may not be so good as those of other boys whose chemical knowledge is less while their ability to draw is greater, and in this way a false equality in chemistry is established between them. It is worth remembering that the drawings which accompany contributions to the learned societies are usually diagrammatic. Of course it must be admitted that the power of drawing any object accurately ought to be cultivated; but there is a time set aside for that, and the natural inability which some boys have in this respect ought not to count against them in a subject where an accurate drawing is not required.

W. A. WHITTON.

Bridgend, Glam.

A Science Syllabus for Preparatory Schools.

My recent letter on the above subject has had the beneficial effect of eliciting some important information from Mr. Oswald H. Latter. It seems that the elementary science papers of the Common Examination for Entrance

to Public Schools follow the lines of the scheme drawn up by the sub-committee of the Public Schools Science Masters' Association; otherwise the two would scarcely be so intimately associated in his argument.

Now, my main contention is for a syllabus. Mr. Latter says that its imposition would be detrimental to the true interests of science teaching; and yet this body of experts, immediately after the establishment of the Common examination, drew up a scheme covering, as he says, "seven pages in double column, arranged under the headings 'Botany,' 'Zoology,' and 'General,' and forming a working calendar for the guidance of teachers." If this is not a syllabus, by what term shall we characterise it? This is the very point I urge—in principle, and with the proviso of official sanction. I would therefore suggest that this scheme, in a condensed form, or preferably *in extenso*, as it appeared in the number of the *Preparatory Schools Review* for March, 1905, should be published as the elementary science syllabus of the Common examination. Is this unreasonable?

It follows that my suggestion has not been rejected as unsound, but the reverse, for it can scarcely be affirmed that an unofficial scheme makes for the guidance of teachers, and that an official one has the opposite effect.

As an enthusiast myself in the matter of science teaching, I may perhaps venture to agree cordially with the principles Mr. Latter lays down, viz., that the work should be undertaken *con amore*, and that preliminary science work should develop the powers of observation and arouse an intelligent interest in natural phenomena.

I will not further trespass upon your space by diverging into side issues.

Brighton.

E. J. PETITFOURT.

Language Teaching in the Sixteenth Century.

THE name which Mr. Chaytor did not recognise (he writes it on p. 456, vol. viii., as Ludnicie Vinis) is the genitive case of Ludovicus Vives.

Perse School, Cambridge.

W. H. D. ROUSE.

[PROF. FOSTER WATSON has written to make the same correction.—EDITORS.]

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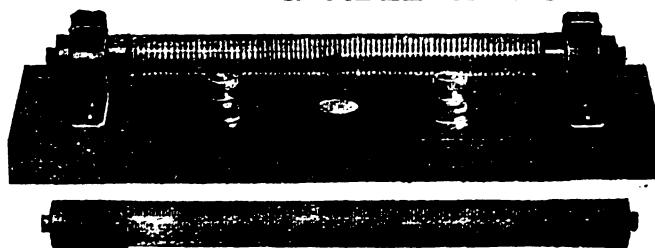
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SIXPENCE.

THE PLACE OF CLASSICS AND SCIENCE IN A GENERAL EDUCATION.¹

By the Hon. and Rev. E. LYTTELTON, MA.

IT will be expected, no doubt, that I should preface my remarks on this subject by some modest admissions as to my own unfitness for saying anything on a question so controversial likely to be useful to an audience of experts.

Now, if this unfitness depended on lamentable ignorance of natural science I should be the first to admit it. But I don't admit that ignorance of either of these two subjects disqualifies a man from holding a fairly sound opinion as to their place in a general education, and as to the methods by which they are taught. It was said once that in these days there were two things required of a classical headmaster : the first was to build a laboratory ; the second was never to go into it. Now this is wrong. If he be a man classically trained he probably possesses the very best qualification for hearing and judging of a science lesson—that is, total ignorance of the subject. For only a man so equipped can possibly judge of the lucidity or obscurity of the explanations given. If I hear a lecture on inorganic salts or electricity or a frog's heart I start fair with the youthful audience, knowing exactly what they know ; that is, nothing. But if for a moment the lecturer goes too fast for me—and he often does—I feel sure that he is leaving several of the boys behind too.

Now when I go to hear a classical lesson I am deprived of this insight, and have to trust to other and more complex indications, not to the familiar sensation of fog gathering in my own brain. To be a good critic of a science lesson, therefore, a headmaster ought to know nothing of the subject, and you gentlemen are to be congratulated on nearly all of you possessing one of these highly qualified judges, who may enter your school-rooms any moment. So when Sir W. Huggins in one of his Royal Society addresses said that the slow progress of scientific studies in England was largely due to the majority of head-

masters having received only a literary training, he little knew that he was, as the poet says, "thus blindly with his blessedness at strife."

But I must cease from this tone of extravagant self-laudation and come to close quarters with my subject. We have to consider the place of two great departments of human intellectual effort in a general education. Now I conceive that there are certain perils in the discussion of such a question which we must do our best to avoid. They may be summarised under the term nebulosity : by which I mean lack of clear definition of the precise matter under discussion. In educational controversy cloudiness of talk is a mighty generator of heat, whether clouds in the sky are so or are not, about which a classical man has of course no right to an opinion. And to avoid heat in discussion I take to be a duty. Secondly, there is the peril of dogmatism : by which I mean the assertion of opinions and preferences in educational matters without saying on what sort of evidence or reasons they are based. If a writer says emphatically that he believes French to be a better subject for boys than biology, the remark may have a personal interest, just as if he told us he preferred grey clothing to black, or dining in the middle of the day to the evening. But it cannot be a contribution to discussion unless he shows that his preference is based on a principle which we hold in common with him. So to avoid these dangers I will try to make clear what I mean by place : then by science : then to state what sort of pupils are being considered. And in affirming any preference I will try to show on what principle it is based. Hence I may be allowed to hope that if anyone dissents from any conclusion he will show at what point exactly in the reasoning he conceives there to be a flaw.

We begin then with the word place : that is, the relation between two educational subjects. To define this is to show what one subject does for a growing mind which the other does not. (Please pardon platitudes at this point ; they are intended as stepping-stones in the argument.) We must get an idea of the faculties which science trains as compared with those which literature trains. Not long ago I heard of a man in a railway car-

¹ Presidential Address delivered before the Public School Science Masters' Association, January 12th, 1907.

riage who remarked to a fellow-traveller that they were passing by a fine field of barley. The other replied that it was not barley but oats. The first man's answer was a remarkable expression of humility. "I am much obliged to you," he said, "for that information. Do you know, it is a singular fact, but I never can tell the difference between one thing and another." Now this gentleman's scientific training must have been superficial, or, at any rate, unsuccessful; but a vast number of educational and other disputants differ from him very slightly, except, perhaps, in candour. Unless we see and agree that we see certain differences between science and literature as instruments of training, we have no right to waste our own or other people's time in saying we believe in one more than in the other.

Please observe, then, that I leave mathematics out of account, and as the remainder of the school time is very largely filled with what may roughly be called literature, I will discuss briefly the differences in the training afforded by these two subjects as educational instruments. But in speaking of science, do I mean experimental work or listening to lectures and watching experiments? English opinion is largely in favour of experimental work, and a good deal is said of its heuristic character. On December 28th we were informed, in an interesting article in the *Times* by Mr. Nicklin, that in America the heuristic system is mightily in the ascendent, while in Germany they believe in lecturing. I will say shortly that for the purposes of discussion I shall take science to mean experimental work done by the pupil himself under supervision and guidance. Perhaps a reminiscence of my school days inclines me to very modest expectations from lecturing. We used to sit in front of the demonstrator, a large group of well-grown athletic boys, unwillingly and languidly watching his experiments. He was a first-rate chemist and an excellent man, but the discipline of the class was somewhat fitful. On one occasion he wished to show us that three different coloured liquids expanded at different rates of speed when heat was applied. I remember the look of three upright glass phials in each of which was a brightly coloured liquid. I hope no one is anxious to learn their exact names. Well, as soon as the heat was applied and the liquids began to rise in the glasses, a murmur was heard which soon gathered volume: "Three to one on the red": and as soon as the lecturer reached out his hand for his punishment register intending to write some one down a Georgic, the cry arose: "He's booking the bet: he's booking the bet." And so our science teaching went on, and in later life I came to believe, on the whole, that experimental work promised better results than lecturing, though it may require relief at times from carefully arranged demonstrations.

Lastly, what pupils am I talking about? A general education nowadays is coming to mean the course of training which, somewhere about 16 or 16½, gradually becomes considerably specialised. So I mean pupils up to that age, and in

order not to stray beyond my experience, boys only, not girls.

So much by way of rather a lengthy preamble. We come now straight into the subject itself by asking what is the special nature of the training given by experimental work in science; to what faculties does it appeal? and then we must ascertain if literature encourages these same faculties or others equally important: and then we shall be justified in framing a tentative estimate of the place they ought respectively to hold.

I will begin my answer to this question by saying that experimental science appeals to the faculty of interest more obviously than any other subject, except, perhaps, religion. It is customary to speak of English people as incurably unscientific and unmusical. I could bring a large number of facts to show that we as a nation have a splendid endowment of musical taste. The evidence of a turn for science is not so strong, nor do I believe there is much interest for it among girls. But among boys from eight or nine years onwards an extremely keen interest in machinery is wonderfully common. It not unfrequently happens to grown-up folk to be entertaining a shy youth who has apparently nothing to say on any subject in heaven or earth: when some one happens to say something about the inside of a motor, and in a minute the company is regaled with a torrent of accurate information conveyed in terms too technical to be understood by anyone present. Of course, there is a reply to this argument. It is said that this interest only belongs to the initial stages of the subject, and that as soon as real brainwork is required the usual proportion drop off and give it up as a bad job. No doubt the science teacher, like every other, has to face the fact of a proportion of failure; but I much question whether it is as large, or anyhow will remain as large, as in the case of classics, when I remember that classics have had an immense advantage in having been able to crystallise and fashion into the best shape possible all methods of teaching which the experience of centuries has guaranteed.

Next, observe that I am only claiming that the initial interest is greater in this subject than in classics. Lastly, the real practical question is not whether science by itself evokes more work than literature by itself, but whether there is not an urgent need for combining the two. If they are combined I am quite sure the number of failures is less than when either is pursued in isolation. There will be some failures whatever we do; but it is not so often observed as it ought to be that one cause of this—mind, only one—is really a source of hope. I mean for this reason. Most of us, I suppose, have come across a few specimens of those remarkable but limited geniuses who are quite invincible in their knowledge of Bradshaw, and show astounding powers of combining opposites in their suggestions for better train service on the Brighton line, we will say. Well, suppose those individuals had been born before railways were invented. They would have

presented to an unappreciative generation the appearance of really stupid people. Now they are made railway directors and ultimately knights. So when you are faced by an unusually large number of quite irresponsible young minds, don't take them on as so many failures, but as indubitable evidence that new inventions are coming. Instead of being the failures of science teaching, let us look on them as the silent heralds of future scientific triumphs.

So much for the initial interest. I will now take one or two of the features of science training which are to me less certain. Huxley speaks of it as bringing the young mind into direct contact with facts. The phrase is a little vague, and a very slight acquaintance with Bishop Berkeley's writings would suggest that there was no distinction in this respect between science and literature. But supposing that in a loose popular sense we grant the contention, what then? Probably the claim would be that minds are thus enabled to distinguish truth from fiction: are, in short, made logical: I think this is possible, but advancing years diminishes to all of us the gravity of the concession. The older we grow the less influence we come to ascribe to logic in human life: and as far as I can judge, men act irrationally, not because their brains are muddled so much as because their wills are weak. But, of course, that is no reason why we should not clear their brains if we can.

Again, Huxley says that science is inductive and all other subjects deductive. I will not discuss how far this is true, but would rather ask where is the harm of being deductive? and if the answer is, what Huxley implies, that in these other subjects the data are supplied by authority, I should demur to that as a description of much modern teaching in classics, history, mathematics, and especially geography: except, perhaps, in the initial stages, where, I fancy, it is true of much science teaching also. But undoubtedly, the change which has come over the teaching of other subjects is itself largely the outcome of the scientific spirit.,

Huxley's next claim is very interesting. It is that science is a fine antidote to pessimism, in that when evil seems to be rampant it suggests its tranquil message of order amid variety in the universe. Perhaps it does. But let us take nothing for granted; rather ask if facts bear out the claim; let us, in short, be inductive, as Huxley himself enjoins. Now, if the claim were undeniably true, should we not find that pessimism and deep discontent were firmly fixed in the minds of classical men or historians or teachers of French, all of whom, we may assume, abominate science, and are deep in the ruts of conventionalism, traditionalism, and so forth? But would any sane man describe these people—if they exist—as pessimists or permeated with discontent? I thought that our accusation against them was that they were profoundly satisfied with things as they are, and their contentment with themselves and their own teaching methods was quite impregnable against

all assaults. Anyhow, your secondary-school classical teacher is not often a great student of Zola or Schopenhauer, and the evidence for Huxley's generalisation seems to me very thin. We have also to remember that in discussing a general education we must not bring in results which are only secured by the advanced student. That is constantly done on the classical side in this controversy; and in this case, in so far as the claim for science can be maintained, it means, I think, that the atmosphere is saturated with evidence of the reign of law and order in Nature; which tends to allay disquiet; but this has been the case for thirty years or more, and I fancy your hide-bound classical man is beginning to feel its influence at least as much as the boy who drops his science work at 16½: but the latter is the individual who is under discussion this afternoon.

Once more the great advocate of science-teaching opines that the excessive importance attached to expression as distinguished from subject matter in published utterances would be checked; redundancy would disappear, and a pithy compact style of writing take its place. Now, on such a subject Huxley spoke with some authority, and I cordially sympathise with the hope to which he gave utterance. I trust it will be fulfilled. The need of some such influence is indeed great: especially since we have discarded from our schools the only writer I have ever read who never wasted a word: that is Euclid.

But I must hurry on to enumerate without comment the advantages of experimental science which seem to me indisputable. They are these: constant appeal to reason; constant verification; constant appeal to the senses of touch and sight; teaching of patience and accuracy. Moreover, it brings a boy into contact with an army of discoverers; men of research who are themselves enlarging the horizon of human knowledge. It also, quite in its early stages, illuminates daily life with interest, by stimulating not only the power of the sense impressions but the desire to use them. It also brings into play the precious faculties of imagination and wonder. Now, it may be that I have left something out of this list; if so, there are many here who could supply it: but there remains for us the extremely important task of inquiring exactly which of these benefits are secured by literature, and whether those which are so secured are secured to the same degree as by science: that is, as inevitably and as adequately.

But there is one remark first which I am constrained to make about the use of the sense of touch. Obviously this is a feature of experimental science in distinction from the lecture-system, and one which no other sort of training given in our schools is able to show, unless you consider handicraft and instrumental music to be exceptions. Now I am relying on what I believe is sound physiology in saying that the development of the sense of touch is of real importance to the healthiness of the brain. I speak, of course, under correction; but is it not a fact that there is direct

connexion between the fingers of the right hand and the left lobe of the brain, and what is far more important, between the left hand and the right lobe of the brain? and that, if you wish to give reasoning power to an idiot you begin by training the fingers of both hands to delicate manipulation? If this is so, why then does not the Science Association make it one of its objects to insist on regular training in ambidexterity being given to children under 14? It is impossible to calculate how much of the colossal bulk of our national stupidity might not be got rid of by this means. I am told the Japanese are ambidextrously trained; and why should we hang back? There may be some idea that our games supply the need; but they do not. Racquets and tennis are, from this point of view, bad games; cricket is to a certain extent one-sided; and even the noble game of fives, though producing harmonious activity, trains the arms, not the fingers: otherwise, perhaps, we should find more cricketers and fives' players than at present exist, who are ready to understand a syllogism in *barbara*. Those who teach experimental science can do something to correct this.

In returning, then, to my subject, let me say that this admirable exercise of the faculty of touch is not given by literary studies, nor is the training of the sense of sight or of the memory of things seen, except as regards words and Greek accents. We put, therefore, two benefits down to the account of science as against literature. The training of the reasoning faculty is constant in tolerably good classical teaching, and in this respect there has been an enormous change in the last thirty years. It is often said that classics train principally the power of expression—my conviction is that their value for ordinary boys lies principally in the constant exercise of the reasoning faculty. Is there any time when the young brain is so admirably stirred to its best exertion as when a boy is called up to construe a lesson which he hasn't learnt? In this one respect I think we may claim the advantage for classics—there being no position in the laboratory quite analogous to that of our idle young friend in the class-room. But I must here interrupt our comparison with two cautions. When I speak of literature in connexion with the general education of boys till 16½ I conceive of classics almost wholly as a gymnastic, the enjoyment which we connect with literature being very seldom felt before that age except from English. The second caution is that in speaking of the training of the reason given by classics it makes a considerable difference, in my opinion, whether the old exercise of Latin verses is included or not. It is customary to poke fun at them, and to ridicule the arguments in their favour rather than to answer them; but it is, to my mind, quite unquestionable that, in their early stages, they teach all that Latin prose teaches of obedience to law, accuracy, patience, grasp of English sentences, besides the grand fact that they give a rudimentary idea of the pleasure of creating something, not to mention a sense of rhythm and also

verification, similar to that yielded by experimental science.

To proceed, then: I should say classical training before 16½ secures, besides training in reasoning, verification to a less degree than science, inductive thinking rather less, touch, not at all, imagination and wonder in a very different way, so that it is difficult to compare the two; and perhaps this power of classics depends even more than the similar one of science on the enthusiasm and personality of the teacher. Indeed, in comparing the two, I think I am right in saying that the success of literary training in its broadest sense is more dependent on the teacher than the success of science. A literary teacher who believes himself thoroughly competent will think this an argument for his own subject; one who believes he still has much to learn will perhaps hesitate. Classical work, however, in schools undoubtedly fails as compared with science in bringing a boy into touch with discovery and research. Some may remember an admirable essay by H. Nettleship on this subject. On the other hand, classical work, even before the 16½ years are gone by, brings a boy more decisively into contact with life, rich, generous, and epoch-making in the history of mankind. Thirty years ago it did not; nowadays I am sure it does, and, I think, in a more vital fashion than science.

The outcome of this comparison is that the two great departments of learning cover, to some extent, the same ground, in that some of the faculties to which they respectively appeal are the same. But they each have a department which the other does not touch, and even where they apparently overlap the nature of the stimulus which they profess to give is not at all the same. Now, as soon as this fact is clearly seen, I maintain that among teachers of science and literature all discord should cease. In educational discussions why should there be so much radioactivity: I mean that particular form of activity, which, according to a popular and probably quite erroneous explanation of radium, means the scattering on all sides of an indefinite amount of heat without diminishing the internal supply? If some Mr. Birrell of the far future should take upon himself to insist despotically that only one of these two subjects should be taught in secondary schools, and he were to invite the votaries of them to decide which of the two was the more indispensable to human progress, then I conceive none of the elements of a lively time would be wanting to the atmosphere. But the case is not so. We are not called upon to state which we think of these two subjects would mean the greater loss if it were withdrawn. There is room for both, and both must be and will be taught to the best of our powers, I hope, as far on into the future as our mind's eye can see.

We ought to be fellow-workers also for the reason that each form of training ought to be a substantial help to the other. Sound literary work ought to spare science teachers the burden of teaching boys how to write in decent English

a description of an experiment: and, similarly, your service to us will soon be even greater. Often and often, when I hear a poor fellow floundering in a long Latin sentence, or reading his carefully written idea of a Greek unseen, the conviction forces itself on me that here is a boy to whom the notion of a cosmos of law and order is strange and unreal. He would never say or write the things he does unless he had deep within him the conviction that chaos, without form and void, still reigns supreme everywhere. He doesn't expect the Latin words to yield anything but empty sound: he would be painfully startled if they did: and from that view of God's universe it is for you, men of science, to rescue him. We cannot do it: at least, we often fail; and I think I may say that a realisation of the number of our failures has begun to wake in us, incredible though it may sound, some long dormant feeling akin to humility. Stirred, then, by it, we call to you to lend us a hand. Come to our aid in a great national work: come with all that you can bring of new device, of resourcefulness, of patience, imagination, and hope. Bring not only spiritual but material instruments as well; anything that has power "to haunt, to startle, or waylay": the most appealing of your lantern-slides, the most quickening of your explosions, the most beguiling of your smells.

People tell us that the modern English boy is lacking in grit and backbone. Some evidence for the statement might be produced, I dare say: but, on the other side, you have a fact, hardly to be disputed, that in resisting the efforts of his teachers to make him think clearly and show some real desire to push on towards fresh truths, dimly guessed at but not discerned, he still betrays many symptoms of ancestral strength of character. But I doubt if anybody here is under any illusion as to the difficulty of the task before us. That task may briefly be described as the making of young minds feel the joy of thinking patiently and clearly. It is the combining of the severity of the scientific mental discipline, its vigour, and its bracing methods, with the discipline and pleasure of literary training, in the hope of our vitally touching more minds than we have succeeded in touching hitherto. And if it should be that sometimes we feel really baffled and almost appalled by the curious lack of response we meet with in presenting to our boys the rudiments of the laws of thought, let me suggest a somewhat novel consolation. One of my pupils some years ago wrote a capital essay on the subject of there being no time or inclination nowadays for anyone to think. He pointed out sadly but truly the proofs which abound in every direction, of the prevailing thoughtlessness, heedless inconsistencies, and shallowness in English life. But the gist of his last paragraph was something as follows: "It may be felt by my readers that this picture of human life is somewhat sombre; and that the progress towards a more prevalent habit of thinking is so slow as to be depressing to contemplate. Perhaps it is; but, on the other hand, let us calmly imagine the contrary. Suppose people

were all thoughtful without exception; everybody in clubs, drawing-rooms, political meetings, and so on: what an awful place the world would be!"

I have only one word to add in conclusion. Much of the last half-century has been noisy with strife over the meaning of the scientific spirit. It has been thought to be hostile to true education and true religion; and most absurd and illiberal things have been said. As to the first if we wish, and we ought to wish, to pursue our great task in a tranquil and hopeful tone of mind, may I commend to you the method of inquiry which I have tried to follow in this paper? It is good to feel sure about the value of the subject we teach: it is good also to abstain from saying that another subject of which we know little is profitless; but it is better than either to have learnt from elementary psychology that there is an urgent need of the other subject as well as of our own. This I take to be liberality based on knowledge, and often the advocates of natural science in education have set a noble example of this liberality in their attitude towards literature. As regards religion, in Huxley's biography it is said that science is not Christian or anti-Christian, but extra-Christian. I see what the definition is aiming at, but surely it is crudely worded, and, anyhow, ought to be qualified by the wise utterance made, as Dr. Gwatkin has lately told us, by a Pope: simply reminding his people that the Founder of our religion claimed to be Himself the Truth, not custom. I prefer to end with this saying rather than with the other.

READING ALOUD.

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READING aloud is properly one of the home arts, and, like other home arts, it has been too much neglected. Time was when the reading aloud of mother or father to the assembled children was an eagerly expected pleasure of the out-of-school or evening hour, or when a circle of sisters at needlework read aloud in turn one to the others. There were girls' schools in those days, where the lesson in "literature" consisted of the reading aloud by the teacher not of selected passages only, but of the whole of some classic, while the pupils, instead of feverishly "taking notes," were pleasingly occupied in fancy-work. Girls brought up in such ways at least enjoyed reading.

I could easily draw another picture—of dreary hours spent in listening, or trying to listen, to some droning monotonous reader, or of Shakespeare "Readings," where the parts were taken by persons who did not trouble even to look the play through beforehand, and where the attention of the company was suddenly diverted from literary interests to arouse a slumbering comrade, or to avert the catastrophe caused by unalert exponents who inevitably stumbled upon passages that needed bowdlerisation. Such misadventures tend to put "reading aloud" into disrepute.

It is not altogether an advantage that the tradition of the "spoken word" of literature should be, as now, almost wholly connected with the stage. In the church also, indeed, portions of a noble literature are constantly read aloud. But too many clergy are afraid, or unable, to read the Bible as though (whatever else it may be) it were at any rate literature. One result of the neglect of this art is a deplorable want of grace and efficiency among platform speakers and lecturers. I began by speaking of my subject as a home art. I ought perhaps rather to have described it as a necessary accomplishment for a citizen. The majority of grown persons, men or women, nowadays find themselves at one time or another under the necessity of saying a few words in public. How often, in such circumstances, does one blush at the uncouth display made by one's own familiar friend or acquaintance. It is not necessary that all men or women should be eloquent. But a modicum of *elegance* in speech and bearing surely ought to be looked for as a matter of course. English *men*, especially, often seem to be indifferent almost to indecency about their appearance and manner in public. I have seen distinguished speakers, men of world-wide renown, adopting attitudes and habits upon a public platform—nay, in the House of Commons itself—that ought not to be tolerated in a civilised community. One great statesman fidgets with his collar, another rubs his trouser leg, a third bobs his head up and down as he stoops over his notes. American, French, and German speakers are far superior to us in these respects. Bearing and carriage are part of good speaking, and should be taught to school pupils by way of the reading lesson.

Pupils, then, should *stand* to read, in a graceful attitude, with the weight of the body equally depending on both feet. The reading-book must be light in weight, so as to be held without fatigue. The print should be clear, and the book held at the proper distance from the eyes. Most school children suffer from too much sedentariness, and it should be a physical rest to change from the sitting to the standing position. Here, however, judgment must be used. Growing girls must not stand for more than a few minutes *consecutively*.

This brings me to the next point, which is indeed the crux in class-teaching of this most difficult art. Nothing is so positively painful or wearisome as to listen to a bad reader. And the teacher of class-reading is between two dangers—either to waste the time of the class upon the backward members, and thereby to induce hatred of the lesson on the part of the clever pupils, or to leave all the work to be done by the bright ones, and let the sluggish remain in their sluggishness. I believe, roughly speaking, this difficulty, which applies, of course, to all other subjects in greater or less degree when taught in class, is settled practically in the opposite sense by men and women teachers respectively. Women, so far, are more conscientious teachers

than men. Also, their impulse is to lift up those that are bowed down, and to help the feeble knees. But the problem of school life ought rather practically to be solved in the opposite direction—namely, on the principle "to him that hath shall be given."

Good speaking, which is the beginning of good reading, is best, no doubt, learnt as well as practised at home. It is often a delicate task for the teacher to endeavour to correct faults of accent and pronunciation that are really due to parental example. In truth the accent and pronunciation of teachers themselves not seldom leave room for improvement. On the vexed question of voice production, in regard to which every teacher seems to have a different and infallible nostrum, I cannot pretend to speak with authority. Probably there are several good methods, and these must be intimately bound up with the proper study of phonetics, by means of which much improvement has been effected in the pronunciation of foreign languages, and which are already being applied to the teaching of English speech. But whichever system commends itself most for class purposes, the exercises *must* be simultaneous. It is not fair to spend the time of a class in correcting the faults of a single backward pupil. In all physical exercises, such as speaking, breathing, reading, singing, a child that needs *much* individual attention should be taught apart from the others. Where circumstances, financial or other, do not admit of this, then that child must suffer. But the majority of children—those, that is to say, who are not actually defective in physique—learn such things more happily and successfully by the stimulation of numbers.

Simultaneous reading, like other reading, may easily degenerate into mere droning; teacher as well as pupil must be constantly on the alert. For these reasons the choice of a "Reader" becomes of the utmost importance. The requisites are many, and the supply of those that meet the requirements few. I am inclined to maintain that any good teacher can in most cases teach out of any bad book. But in reading, the printed matter actually before the pupils counts for everything. Publishers seem sometimes to vie with one another in bringing out unreadable Readers. They alternate between selected passages of prose and poetry, each one more deadly dull than the last, and abridged editions of Scott, Dickens, &c., encumbered with notes and introductions, to the detriment of the printing of the text.

Literature is *spoken music*, and the ultimate test of a classic is its power to please the ear. The *vox populi* preserved the ancient literatures, and in spite of the printing press it will be the *vox populi*, in the same traditional sense, that will decree length of life to modern books. This is obvious in the case of verse, but it applies equally to prose fiction, such as the novels of Jane Austen, George Meredith, or Thomas Hardy, which will live for the sake of their sound when those of less sonorous authors lie dead. Certain forms of this music appeal more readily and universally than

others. Verse, especially of the jingling or ballad kind, is the most attractive to young children. On the other hand, it is given to few persons, and assuredly to none of school age, to impart life to the reading aloud of an essay (say) by Macaulay.

The reading lesson should be a lesson in *reading aloud*, and neither an explanation (of an elaborate kind) nor a repetition of the text, for faults can be corrected as well in one passage as in another, and continuity of interest is essential to the lesson. The saying "In the beginning was the Word" is capable of many applications. Read aloud even a fairly difficult passage from a great author to an intelligent child, without *explanation*, but with just intonation and sympathetic inflection, and you will find the general sense has been understood, though a few words may be unfamiliar. Half of these new words will be at once understood from the context, and the vocabulary of the pupil thereby immediately enriched, and the rest will occur presently in a fresh context which will of itself again, in nine cases out of ten, make them clear. The Reader, then, must consist strictly of text, without any other addition whatsoever in the shape of glossary, notes, introduction, or examination questions.

Scraps, tit-bits, selections, extracts, and every kind of incompleteness are to be by all means deprecated. School children inevitably suffer to some extent from interrupted work, and thereby acquire disjointed impressions. But a work of art of whatever kind must be perceived, if at all, as a whole. Imagine, for example, giving a class a portion of a picture to look at, while the remaining portions are carefully covered from sight. We should therefore select in the case of poetry, so far as possible, poems of such a length that one or more can be read through in a single lesson. Of prose narrative, or longer narrative poems, a long enough portion should be read to awaken the sense of continuity, and to enable pupils to retain the story in their minds until the time comes for the next instalment. The ideal Reader should contain (1) genuine literature, not diluted as in "Tales from Spenser" and the like. It should consist of either (2) continuous prose narrative of a lively kind, with plenty of interspersed dialogue, or of (3) short, complete narrative or lyrical poems, or (4) complete dialogues or plays, or (5) a complete section, or book, of an epic such as the "Faerie Queene," or "Paradise Lost." Dramatic or dialogue reading, whether of an actual play or of conversational portions of a continuous narrative, serves best of all to stimulate the interest even of a dull class.

Publishers are tempted to provide pictures for their specious attractiveness. But as illustrations to *literature* they are worse than useless. Beautiful words should be left to make their own appeal to the imagination. Some Readers, in many respects excellent, are very faulty in this direction. The pictures are often weak in conception and execution, and can only foster bad taste in the child-

ren. The proper use of school illustrations is to explain *facts*—but this subject deserves an article to itself. In any case, the small size of book illustrations and the poverty of the reproductions tend to weaken the perception of what is really beautiful in pictorial art.

Such being the general aim of the reading lesson, the skilful teacher will easily devise means for keeping the class to its proper pitch of alertness. For lyrical poems, or ordinary narrative poems, simultaneous reading by the whole class, or by groups each under an appointed leader, works well. While one group stands to read, the rest may listen with closed books, and be instructed to notify (in the usual manner) when a word or passage is not clearly rendered by the readers. The next group may stand and read in its turn, and finally, perhaps, the teacher may read a verse or two alone, or act as leader to one of the groups. In dialogue passages, whether in prose or verse, parts may be allotted either to individuals or groups, according to the size of the class, *all books* may be open simultaneously, and each group must be alert to take up its portion *instantly*, rising in its place as the preceding group sits. The penalty for not being on the alert would be to miss the turn and let the next group take up the part. A good many pupils object, from inertness, self-consciousness, or diffidence, to hear the sound of their own voices reading aloud alone. But as members of a group they may often be stirred to *esprit de corps*, or collective ambition which overcomes individual diffidence.

Where time permits, pupils may be encouraged to read through to themselves the piece to be read in class, and to note the different effect of the words as spoken from the passage in its dead form, as mentally conceived. Such reading lessons as I am suggesting could be carried on higher up in the school than is usually considered possible for the first of the three R's. The curriculum need not be thereby further burdened. Properly graded reading lessons in the lower forms would have "brought" the pupils "acquainted" with so much good literature that the *literature* lesson proper, as distinguished from the reading lesson, would be spent in studying to more profit the details of a work already well known as a whole. Thus, by my system, Forms III. and IV. (say) would have read through three or four Shakespeare plays in one year, as well as an abridged Scott, or Dickens, or possibly one of Tennyson's narrative poems. The vocabulary of the great writers would be familiar to them as it is in the natural course of things in a cultivated family. When "Hamlet" is already known, a familiar friend, as a whole, time is well spent in picking out the cruces for special investigation and comment. But this earlier spade-work must be thoroughly well done in order to secure good results later. I am contending, it will be seen, for the voice of the poet (or *Dichter*, to use the excellent German word, which includes "prose-writer" as well) to be heard in the class-room,

more loudly and more often than the voice of the teacher. Ears accustomed to "sweetest Shakespeare's . . . wood-notes" or to Milton's "god-gifted organ voice" might perchance be led to shudder at the stuff that our printing presses disgorge in the name of literature. Indeed, I sometimes dream of a time when in every school playground pupils may be induced to make a holocaust for the burning and destruction of "books that are not books."

MEASUREMENT OF TIME-INTERVALS IN EXPERIMENTAL MECHANICS.

By J. SCHOFIELD, B.Sc., A.R.C.Sc.

Fellow of the Physical Society.

"The English teach Mechanics as an experimental science; on the Continent it is taught always more or less as a deductive and *a priori* science. The English are right, no doubt."—POINCARÉ.

In this quotation, perhaps unduly flattering to English mechanics, the distinguished French mathematician has crystallised the radical differences between the two methods of teaching mechanics. On the one hand, we have mechanics regarded as mixed mathematics, its exercises consisting in the solution of equations in which mechanical unknowns replace the familiar x and y . This point of view is typically represented by Lagrange, when in the preface to the "Mécanique analytique" he says, "On ne trouvera point de Figures dans cet Ouvrage. Les méthodes que j'y expose ne demandent ni constructions, ni raisonnements géométriques ou mécaniques, mais seulement des opérations algébriques, assujetties à une marche régulière et uniforme. Ceux qui aiment l'Analyse verront avec plaisir la Mécanique en devenir une nouvelle branche, et me sauront gré d'en avoir étendu la domaine."

On the other hand, we have mechanics considered as pure mechanism and the anatomy of machines. Now, as far as mechanics forms a part of secondary education, there is room for a course involving the best features of both systems of study, a course in which theory goes hand in hand with practice, and in which principles are deduced from and tested by properly co-ordinated experiments. To appeal again to Poincaré: "We can now understand why the teaching of mechanics should remain experimental. Thus only can we be made to understand the genesis of the science itself. Besides, if we study mechanics, it is in order to apply it, and we can only apply it if it remains objective. Now we have seen that when principles gain in generality and certainty they lose in objectivity. It is therefore especially with the objective side of principles that we must be early familiarised, and this can only be by passing from the particular to the general, instead of from the general to the particular."

Since the introduction of laboratory work for students into the courses of English secondary schools, and especially of practical work in physics, some experimental mechanics has been common, but only of the statical kind. Experiments upon the triangle, polygon, and parallelogram of forces, upon moments and levers, and upon centres of gravity, are readily devised and conveniently applied; to a less extent, and less satisfactorily also, experiments with pulleys and upon friction. There has been, however, an almost complete absence of kinematical or kinetical experiments, these branches of mechanics being almost solely represented by crude experiments upon Atwood's machine. No teacher of mechanics can direct attention to this gap in our pedagogic armour without quickly discovering that it is almost entirely due to the difficulty of measuring the time-intervals of the motions under consideration. Almost all the forms of apparatus designed for experiments in kinetics seek to avoid this difficulty either by a system of coincidences, as in certain forms of pendulum apparatus, or by special devices; e.g., the vibrating spring used with Fletcher's trolley.

Now it would be well if, having recognised the radical difficulty in experimental kinetics, we may consider whether it is not better to attack the problem directly, and strengthen our experimental means of measuring time-intervals by the employment of some form of chronograph. Thus, suppose a course of experimental kinetics arranged upon the plan of a series of studies of typical motions, such as the following:

I. TRANSLATIONS.

1. Uniform velocity; e.g., sound waves.
2. Uniform acceleration; e.g., (a) falling body, (b) projectile.
3. Variable acceleration: (a) regular acceleration; e.g., pendulum; (b) irregular acceleration; e.g., train.

II. ANGULAR MOTION.

4. Uniform velocity; e.g., earth's rotation.
5. Uniform acceleration; e.g., pulley rotated by a falling mass.
6. Variable acceleration.
 - (i) Regular; e.g., (a) torsion pendulum, (b) planetary motion.
 - (ii) Irregular.

Of these types of motion, Nos. 2 (a), 3 (a), 5, and 6 (a) are capable of experimental treatment in an ordinary laboratory; Nos. 1 and 2 (b) less fully, but still affording much experimental illustration; while for the train, the earth's rotation, and planetary motion, experimental data exist which may be discussed in a manner almost as complete as those derived within the laboratory walls. It is readily possible to apply some form of chronograph to the direct study of the motion of a falling body, a flywheel, or the bob of a pendulum, all that is necessary in each case being the arrangement of suitable electric contacts

which shall give the time-intervals occupied in executing known displacements by the system in question. This in itself is not a serious matter, and the convenience in the employment of one standard instrument, such as the chronograph, throughout a series of kinetic studies may be readily appreciated.

Upon these lines, the experimental study of some particular type of motion merely resolves itself into the construction of suitable signalling devices whereby the moving body may record its arrival at certain points by time signals upon a chronograph. The particular form of chronograph is largely immaterial. Dr. Griffiths's instrument, made by the Cambridge Scientific Instrument Co., which marks upon a paper tape in

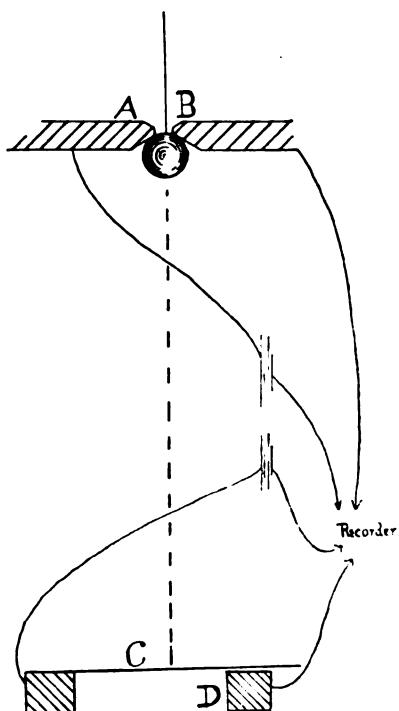


FIG. 1.

the manner of a Morse telegraph apparatus, may be employed; or, if preferred, some apparatus of the tuning-fork and rotating-drum type. A course of experimental dynamics, such as the one outlined above, has been fully worked out in the physical department of a large secondary school by the writer, and in this a tuning-fork chronograph reading to $1/250$ th second was employed.

As an illustration of the methods employed, the case of an ordinary falling body may be selected. Preliminary lessons upon the tuning-fork and the electro-magnet, leading to the principle and action of the chronograph, are supposed to have been given, together with the methods of standardising the tuning-fork, e.g., by the use of a pendulum swinging through a drop of mercury sending electric signals to the chronograph.

An ordinary steel ball, such as is employed in cycle bearings, forms a convenient falling body, a suitable diameter being about 0.5 cm. Suspend this ball, say, by a fine thread between the two metallic jaws, A B of Fig. 1. These jaws form part of an electric circuit, including the recording mechanism of the chronograph, and this circuit will be completed through the steel ball. On the table or floor below place a thin metallic spring, C, adjusted immediately over, but not touching a metallic stop, D; this forms a second electric circuit through the recorder. If the thread is now burnt, the steel sphere will drop, and the first electric circuit will be broken at the jaws, A B; the stylus of the recorder will then make an upward throw, marking the commencement of the motion. On reaching the spring, C, the second circuit will be completed at D by the shock of the ball causing contact between the spring and stop; the stylus of the recorder will then give a downward throw, marking the end of the motion. If now the number of waves marked by the tuning-fork upon the drum of the chronograph between these two throws of the recorder be counted, the time-interval occupied by the ball in falling through the distance A C may be obtained; this distance may be measured by a scale. By placing the spring at different levels, a number of spaces and times may be obtained.

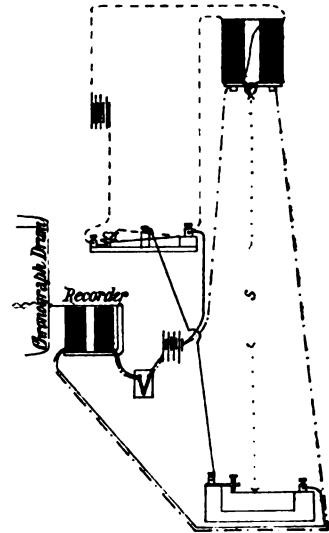


FIG. 2.

A superior method of experimenting, in which two "breaks" are employed instead of one "make" and one "break," and in which the steel ball is held in the jaws by magnetic attraction, is sketched in Fig. 2. A special electric key, which permits the circuit of the recorder being made again during the fall of the body, is employed, and a spring is made to break contact with its stop, instead of, as formerly, to complete the circuit.

The following are actual results of experiment, many taken by a student of fifteen years of age :

Spaces (cms.)	Times (in waves; $252.6 = 1$ sec.)	Times (secs.)
48.1	79.8 (80, 80, 79.5)	0.3159
81.0	103.8 (103, 104, 104.5)	0.4109
148.1	139.0 (138.5, 139, 139, 139.5)	0.5502
199.2	166.2 (159.5, 159.5, 160.5)	0.6342
299.1	196.5 (194, 196, 199.5)	0.7779

These yield by calculation the constants of the following table:

Space	(Time) ²	$s/t^2 = n$
48·1	0·0908	482·0
83·0	0·1688	491·7
148·1	0·3027	489·3
199·2	0·4022	495·2
299·1	0·6051	494·3
Average ..		490·5

The curves of motion for the falling body are here appended.

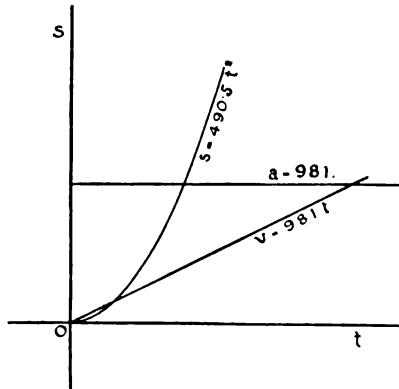


FIG. 3.

In this manner the motion of a body falling under gravity is made the subject of direct investigation; at the same time, on the score of accuracy the results leave nothing to be desired. Further, the student is provided at the very outset with the fundamental constant of mechanics, viz., g =acceleration at the earth's surface. Lastly, the method employed is perfectly general in character, in that the primary mechanical quantities, viz., the displacements and the time intervals, are directly measured.

By suitable arrangements the motion of a pendulum bob may be studied, employing the chronograph to yield the time intervals occupied in executing known displacements, and the subject of simple harmonic motion developed from first principles and in a natural manner. Similarly, apparatus may be devised to prove the fundamental dynamical law $F=MA$. In the present paper, space is too limited to enter into a full explanation of the exact experimental means employed. Perhaps, however, sufficient will have been said to convince teachers of mechanics that the chronograph may form a valuable aid in practical dynamics, and that it deserves to be more widely employed in our physical laboratories. As a result of my own experience, I can testify to the clearer conceptions of mechanical quantities and processes which students obtain as a result of the employment of teaching methods based on the foregoing principles.

THE DIRECT METHOD OF TEACHING FRENCH.

By S. A. RICHARDS, B.A.

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THE direct method has passed through the experimental stage; it is no longer necessary to take up the cudgels on its behalf; the battle has been fought and won. It is at this stage that we can afford to make concessions, to review the past, to see whether our enthusiasm has led us too far in any particular direction, and to fix upon the just mean between two opposite extremes.

We are not likely to abandon any of the broad principles laid down by the reformers. It is with regard to details that considerable latitude must be allowed, latitude called for by the varying individuality of the teacher and the circumstances in which he has to work. There is, perhaps, a danger of the theorist's overlooking this fact. It is only when we come to apply general principles that we fully feel the force of modifying circumstances. It is of some of these modifications, necessitated by the exigencies of the class-room, that I wish to speak. I am concerned with the teaching of French only, and will restrict my remarks to that language, though, doubtless, most of them will apply with equal force to German.

So much skill and ingenuity are bestowed upon the compilation of the modern class-book, that, at first sight, one is tempted to think that a boy who is lucky enough to have it placed in his hands cannot fail to become keenly interested in his work, and to make solid progress in the language he is studying. But this view involves the assumption that every boy is bright, intelligent, and eager to learn; a state of things which, as every teacher knows to his cost, is far from being the case. His progress depends largely on his ability and desire to make those inferences to which his book invites him at every turn. There are boys who will do this; there are others who, if they possess any powers of inductive reasoning at all, prefer to make use of them out of school. I have a class of young, picked boys who have come to me with County Council scholarships from elementary schools. With them I apply every principle of the direct method without any modification, and the work goes merrily and smoothly on. But I have other classes, alas! The difficulty is briefly this: How can we be sure that the dull boy is grasping every point of our teaching, and that the shirker is really being made to work? These shirkers constitute a fairly large class, and must not be neglected. Only a practical schoolmaster knows what misguided ingenuity some boys will bring into play in order to avoid making those inferences dear to the reformer's heart. Experts are, perhaps, apt to fall into the fallacy of the too-ardent social reformer, whose Utopian picture of society as he would have it might be realised if all men were good citizens.

The difficulty is aggravated by the size of our

classes. The ideal modern language class would not exceed fifteen, or at most twenty boys. But how many of us can hope for such a state of things? We must put the average at something nearer thirty. What is the actual amount of speaking practice, of individual attention, that each boy in such a class is likely to get during a lesson lasting three-quarters of an hour? The answer is discouraging. Of course, if we could depend on every boy really using his brains and straining his attention, not only when it is his turn to answer, but while others are answering also, the difficulty would not be so great. In the case of bright boys we can get these conditions; but in spite of all that may be said on the subject of making things interesting and securing attention, any teacher knows that there is a numerous class of boys who will gaze at you with an angelic expression of willing attention while their brain is indulging in complete and soothing repose. These are the boys who refuse to make the slightest effort to infer the meaning of a new word from its context, however artfully it is introduced—even with the aid of explanatory footnotes in French, often more difficult to understand than the text itself!

Suppose we are attacking a fresh page of reading matter, and that we rigidly exclude English. How are we to guarantee that these boys understand what we are reading about? We take the precaution of inviting questions: "Que veut dire 'bientôt,' monsieur?" and so on. We endeavour to answer them in French simple enough to be understood by the boy who could not infer the meaning of "bientôt" from the text—not an easy matter. We shall be lucky if we are not asked the meaning of some word used in the course of our explanation; it is difficult to avoid the fallacy *ignotum per ignotius*. We shall have no doubt, however, as to our having made the meaning clear, for the instant we succeed in this, the boy is sure to ejaculate the word "soon," almost unconsciously, making us wonder whether we might not as well have told him the English equivalent at once and thus saved valuable time. If we answer all questions in this way, we shall not get through much in a lesson, while the thread of the narrative will be so interrupted as considerably to diminish its interest. At the end of the lesson, moreover, we shall be painfully conscious of the fact that the dullards and the shirkers have not asked a single question. How much have they learnt?

Appearances are apt to be deceptive. I have known boys become quite skilled in answering such questions as: "Où était Robert? Qu'est-ce qu'il faisait? Qui était dans le jardin?" and so on, based on the text, who yet remained ignorant of the meaning of several of the words employed in the course of the conversation, and apparently had no desire to acquaint their teacher with the fact. But even if these and similar tests were adequate, it is impossible to make sufficient use of them in a large class to ensure every member of it fully understanding the text.

Now suppose we are shameless enough frankly to translate the piece, thus ensuring that every boy has grasped its meaning. I contend that we have saved valuable time. Now let us put the English entirely aside and work through the text by means of question and answer, with books open. We shall find the results much more satisfactory now that everyone knows what is being talked about. Repeat the process with books closed, pestering the dullards with questions. Don't leave the passage till the average boy can practically reproduce it orally. We shall thus have achieved twice as much in the time. As for the intrusion of English, you may be sure that, by the other method, every boy who did understand the new words had their English equivalents in his mind. It is only after long practice that "cheval" will produce the same mental impressions as "horse." In spite of the aid of pictures and the exclusion of the mother tongue, the English word will rise into consciousness, and form the stepping-stone between the French name and the object in the early stages. Any process, therefore, that saves time by enabling the pupil to get at the meaning of new words, and so leaves more for using them in their natural context in conversation, brings us nearer this final and desirable state of things.

After the first year we are met with a new difficulty—that of providing suitable written exercises. Those hitherto employed—the completion of incomplete sentences, change of number, gender, person, or tense, the answering of questions—will not carry us very far. If English is to be excluded, we have no alternative but free composition, an excellent exercise (especially when done orally), but one that has its limitations. In the first place, free composition breaks no new ground. It is useful in aiding the pupil to make a ready use of what he already knows, but it cannot be employed to drive home fresh grammatical knowledge. Moreover, it offers boundless scope for the shirker. If he is in doubt about a construction, he avoids it. It does not necessarily foster the habit of thinking in French, for boys invariably form their sentences mentally in English first and then proceed to turn them into French with disastrous results. But the chief objection to it lies in the impossibility of proper correction. In the case of a class of thirty boys, the utmost we can do is to return the compositions with mistakes underlined. We have no time or opportunity to go over his exercise with each boy individually, and, as each version is different, we cannot talk about more than a small fraction of the mistakes collectively. What have the boys gained? I suggest the following alternative.

Take a short, pithy story, complete in itself, the point of which does not fully appear until the end is reached. It will command universal attention. Treat it as I have already described; ask questions on grammatical points; run through the irregular verbs occurring in it, and so on. As before suggested, do not leave it until the class can

practically reproduce it. Now set, as a written exercise, an English version sufficiently different to form a real exercise, but constructed skilfully of material found in the original. When the corrected versions are given back to the class, the teacher can discourse upon the commonest mistakes and elucidate difficult points. This is the most valuable part of the whole business. He discusses the passage sentence by sentence, writing each upon the board when the correct form has been elicited from the class. The pupils thus correct their own exercise, and learn something by the process.

The advantages of such a story as compared with a descriptive passage, or a portion of a continuous narrative, are great. Even the dullards are attentive and anxious to grasp the *dénouement*. I find that descriptions of the way in which the peasant ploughs his field, or of the wonderful things to be seen in Paris, leave boys cold. It may be regrettable, but it is a fact. I would frankly abandon any attempt to create a "French atmosphere" in the class-room. It is too artificial, and the English boy looks upon it with undisguised contempt. And, above all, do not put anything before him which he is likely to dub "soppy" or babyish. That is fatal.

Before the written exercise is set, the story may be given, from time to time, as dictation. This is an excellent way of impressing the vocabulary and constructions upon the boys' minds.

A useful variant of the above process consists in reading a story to the class in French, care being taken that every boy understands every word of it. This may sometimes involve translation, but various methods may be adopted—e.g., question and answer in French, the questions being so formed that the answers practically reproduce the story. Encourage boys to ask the meaning of every word they do not know. Give them the English equivalent, unless it can be made clear in French without waste of time. Write all such words on the board for revision. Stick to the tale until the class is thoroughly master of it. The exercise may now consist in reproducing the story, in writing, from memory. An additional advantage gained in this case is the increased interest that boys always take in anything that is not in the book.

I believe that, as a general rule, composition of this kind, controlled by conscious imitation of a passage already familiar to the pupils, will be found more beneficial than that in which unfettered freedom is too often prone to degenerate into licence of a grotesque and certainly uneducative kind. Let the diction be simple, and the subject-matter free from anything of an abstract nature. It is useless to expect children to run before they can walk. How, then, can they handle with advantage, in a foreign language, ideas more abstract than those which they are capable of expressing in their own?

Other modifications of modern ideas suggest themselves. For instance, there is an irreducible minimum of grammar grind which had better be

frankly treated as such. My experience is that the four "regular conjugations" should be learnt straight off. Time is thus saved, and the pupils possess a greater command over the use of the verb than is the case when they have been subjected to the mystifying process of meeting with isolated tenses of verbs of various types, among which they strive in vain to find some guiding principle of tense-formation. Boys do not object to a little mere memory work; they take pride in mastering things which must be known, provided they can see what they are driving at. The other method, indeed, demands as much from the memory, in small doses, without enlisting the aid of the intelligence.

Further instances will occur to the minds of modern language teachers; but enough has been said, perhaps, to show that there is at least room for the view that the tenets of the direct method should be made elastic. Individual experience counts for much. Let us hold fast the general principles which have done so much of late to make the teaching of modern languages a living thing, not forgetting the old motto: "In things essential, unity; in things doubtful, liberty; in all things, charity."

SOME DEFECTS IN THE TEACHING OF HISTORY IN SCHOOLS.

By F. J. C. HEARNSHAW, M.A., LL.M.

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II.

In my first article¹ I gave a detailed account of what by various authorities, viz., educational theorists, public examining boards, inspectors, and historians, are regarded as defects in the teaching of history in schools at the present time. These defects—if one may be allowed to admit them to be real and not merely imaginary—can be classified under three heads:

First, there are defects in *aim*. Some teachers have wrong ends in view. A larger number have no particular end in view at all; they impart instruction in history because the subject is down on their time-tables, but they do not trouble to ask themselves what its educational value is, or what purpose it is fitted to serve. Prof. Ramsay Muir, of Liverpool, expresses this well, in a paper published since I wrote my first article,² when he says: "I think the supreme cause of the general ineffectiveness of historical teaching is that too often neither the teacher nor the writer has stopped to ask himself what are the purposes for which it is worth while to teach history to young students, and what effects upon the minds of the pupils the history lesson ought to attain." It is as though an operative were in charge of a

¹ See *THE SCHOOL WORLD*, January, 1907.

² "Criteria of Historical Teaching" in *The University Review* for November, 1906.

machine the handle of which he continued faithfully and systematically to turn without concerning himself to inquire whether he was working a mangle, or a knife-cleaner, or a sewing-machine, or a churn!

Secondly, there are defects in *material* or *subject-matter*. Even when the general ends and objects of the teaching of history have been determined and agreed upon, frequently the portions of history chosen as the means for compassing those ends and attaining those objects are selected injudiciously. Sometimes the defects are inherent; for much that must be allowed to be history is wholly devoid of educational value and is best forgotten: sometimes the defects are merely relative to the ages of the pupils; history valuable at one period of a school career is unsuited to another. It is as though a dairyman, knowing that his task was to make butter in a churn, were to put into the churn weak tea or small beer, in the hope that Providence, conciliated by his industry, would intervene to save him from failure.

Thirdly, there are defects in *methods* of teaching. Much educational work directed towards a well-conceived end and excellent in substance is rendered ineffective by faulty mode of presentation. It is as though a workman with a definite design before him and good material in his hands, were to spoil the whole result of his labours through want of technical skill.

AIM.

Of all these groups of defects the most important is that which relates to *aim*. Unless a teacher has some definite conception both of the ends and purposes of education as a whole and of the functions of history in particular, he cannot, except by accident, achieve very much. Let us, under the stimulus of our critics, ask ourselves what varied aims the teacher of history may legitimately pursue, or, in other words, what definite educational ends the history lesson may be expected to further. The enumeration will be long; for history is an implement of wide adaptability. The wise teacher will make his selection according to the ages and conditions of his pupils and the circumstances amid which he is placed.

(1) History may be used, especially in the case of younger boys and girls, to inculcate *patriotism*. I am aware that some educationists (e.g., Mr. R. Somervell¹) and some historians (e.g., MM. Langlois and Seignobos²) object, and say that it should not be used for this purpose at all. The latter authorities, for example, remark: "On renonce à employer l'histoire pour exalter le patriotisme ou le loyalisme"; but when they add the significant explanatory words, "*comme en Allemagne*," one realises that it is not of patriotism so much as of jingoism that they are thinking, not so much of the enlarging and ennobling

love of the homeland as of the narrowing and degrading hatred of other lands which is too often the complement of patriotism. Patriotism is a "vulgar vice" only when it exists apart from other loves, and is ignorant and unsympathetic. In its pure and well-proportioned form, as one of a group of kindred virtues, it is a necessary constituent of the good citizen. By no other means can it be nourished, developed, and trained so well as by history. The child who, as he grows to manhood, is made to realise in what sense he is the heir of all the ages, will not be likely, in the days of his maturity, to be filled with a boastful consciousness of rights divorced from duties, of privileges unaccompanied by responsibilities. The possibility that in the future this country and this empire may be governed by a democracy ignorant of history presents a prospect of inconceivable danger. Are the future records of our land and its dependencies to be like those freak novels of composite workmanship—each chapter written by an author totally unacquainted with the plot of any of his predecessors?

(2) Closely akin to patriotism, related to it indeed in much the same way as a general principle is to its applications, are the duties of *citizenship*, the practice of statesmanship, the practical conduct of affairs. History not only provides the patriotic incentive to civic goodness; it supplies a storehouse of precept and example whence, throughout his life, the historically trained citizen will be able to draw guidance and direction. History, says Prof. Firth, is "a kind of knowledge which is useful to men in daily life." Carlyle expressed the same truth when he remarked that "History is the letter of instructions which the old generations write and posthumously transmit to the new." Prof. Seeley used to admit freely that apart from its practical usefulness, he would have had but little interest in history. Of course, school children cannot be expected to understand what is meant by the aphorism that history is past politics, and politics present history; but before the end of their school days they should be helped to realise that the social and political problems with which their parents are concerned, and with which they themselves will one day be called upon to deal, are in essence the same as those over which in days long past statesmen and soldiers pondered and fought. They will then study history, especially that of the more modern periods, with a new zeal, and with that added interest which springs from recognition of utility.

(3) But history may be made to subserve *ethical* as well as national and civic ends. Mr. Froude held the view that the one distinct and unmistakable lesson taught by history is "that the world is built somehow on moral foundations; that in the long run it is well with the good, in the long run it is ill with the wicked." He said of history that "It is a voice for ever sounding across the centuries the laws of right and wrong." Perhaps very few thinkers of Mr. Froude's rank would, at the present time, express that view so strongly. Some boldly deny that history, if

¹ Barnett's "Teaching and Organisation" (Cambridge University Press), p. 162.

² "Etudes historiques" (Hachette), p. 258.

viewed steadily and as a whole, teaches the lessons of high morality at all. But, whether that be so or not, it is not these lessons which it is expected to teach in schools. It is asked to fulfil the lowlier ethical tasks of widening the interests, of enlarging the sympathies, of elevating the level of thought, and of showing in some measure the connection between character and destiny. Principal Caird once wrote,¹ "History, like foreign travel, widens a man's horizon, and can scarce fail to broaden his views of life, to correct his prejudices, break down his narrowness of thought and feeling, and give his sympathies a wider range." What is true of the man is true in degree of the child. History, if taught with imaginative skill, lifts the child out of the narrow world of home and school, and transports him beyond the commonplace circle of his acquaintances, placing him in a larger sphere where happen great events, and where he moves in familiar converse with kings and warriors and saints.

(4) Finally, and in the view of the scientific historians primarily, the study of history should perform an *intellectual* function, or rather various intellectual functions. By it the imagination should be stirred. "By constant efforts to recreate the real past and make it live again, the pupil's imagination is at once quickened, strengthened, and disciplined"; so say the American "Committee of Seven."² No history lesson, however well-designed and full of knowledge, should be considered to be a good lesson if it never raises the pupils above the dull level of the here and now, or carries them some way towards the magic land of "once-upon-a-time." Moreover, the judgment should be trained, the habit of correct thinking instilled, the recognition of the sequence of cause and effect made familiar. "The chief object of every experienced teacher," it has been said,³ "is to get pupils to think properly after the method adopted in his particular line of work; not an accumulation of information, but the habit of correct thinking, is the supreme result of good teaching in every branch of instruction." It is comparatively easy to inculcate exact modes of thought in mathematics which deals with abstractions, or in science which is concerned with the invariable and recurring phenomena of nature. But history never repeats itself, and the world to which history introduces a child is precisely that world of affairs in which he will in after-days have to live and move and have his being, a world in which probabilities take the place of certainties, and in which the surest inferences partake of the nature of intelligent guesses. Says Mr. Lecky,⁴ "It (*i.e.*, history) is, I think, one of the best schools for that kind of reasoning which is most useful in practical life. It teaches men to weigh conflicting probabilities, to estimate degrees of evidence, to form a sound judgment of the value of authorities. Reasoning is taught by

actual practice much more than by any *a priori* methods." Again, by means of history the spirit of impartiality should be fostered. History contains the record of many heated conflicts which have cooled to a point which makes analysis possible. "We can study," says Principal Caird, "the actions and the conflicts of past times, the characters of the combatants, and the varying fortunes of the causes for which they lived and died, with the unimpassioned calmness of the observer of the phenomena of nature." It is possible, therefore, for a teacher to point out how much of truth there was on each side, how much of nobleness in each of the contending forces, and to show that in the majority of cases the complete victory of neither belligerent cause would have been to the profit of humanity. If pupils in any large numbers can be taught this lesson so well that they can in after years apply it by analogy to the conflicts of their own day, there will be a perceptible lessening of the bitterness of political and religious controversy.

The history lesson, further, may be so ordered as to impart other valuable habits. Better than most subjects, history may be made to provide a training in the use of books. Few branches of knowledge are more important than this to one who wishes to lead the intellectual life in these days of voluminous writing, of frenzied publication, and of unscrupulous advertising. What books to read, how to read them, how to collect and arrange material, how to separate the trivial from the important—the knowledge of these and similar matters is worth years of toil to a scholar. By means of the teaching of history this practical wisdom can easily and pleasantly be imparted to classes of older and more advanced students.

Such are some of the great aims—civic, moral, and intellectual—which the teacher of history may keep before him. Which of them will be at any given moment the most prominent will, as I have already remarked, depend on the ages of his pupils and their circumstances. For example, with very young children it may be enough to attempt by graphic narrative of wonderful and heroic deeds to quicken their imagination, and to waken them to sympathy with "hopes and fears they heeded not." With older children the civic ideal will become increasingly prominent.

In my next, and concluding, article, I shall deal with the materials of history and the modes of teaching suited to the various ages of pupils, and calculated best to attain the different ends of education.

The Gospel according to St. Luke. By W. Williamson. 240 pp. (Methuen.) 2s.—This is intended for junior forms, and will be found useful, since it is evidently the work of an experienced teacher. The notes are just what is required in an edition of this description, and the introduction is capitally done; but the outstanding merit of all the editorial work is its extreme clearness in the matter of arrangement. The examination questions will be found helpful.

1 "University Addresses," p. 228.

2 Report, p. 26.

3 Report of Committee of Seven, p. 18.

4 "Political Value of History," p. 47.

THE STUDY OF THE LIVING PLANT.
SIMPLE EXPERIMENTS FOR "PRELIMINARY CERTIFICATE" STUDENTS.

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II.

THE purpose of the experiments described in the present article is to examine the conditions under which the adult green plant obtains its food-supply.

FOOD OBTAINED FROM THE SOIL.—It was seen in my first article (*THE SCHOOL WORLD*, January, 1907) that seedlings, growing in damp sawdust or clean sand only, presently droop and die, while similar plants in soil remain healthy and grow to full size. Burn to ash in an open crucible soil-grown bean plants of various ages, previously washed and dried in the oven; weigh the ash, and notice that it increases in amount with the age of the plant. Similarly weigh the ash obtained from bean seedlings of various ages grown in damp sawdust or clean sand, and notice that its amount does not increase with the age of the seedling.

The ash or mineral matter is evidently derived from the soil. Shake up a handful of soil with water and filter the liquid through filter paper in a funnel. Evaporate the clear solution thus obtained to dryness on the water-bath, and afterwards strongly heat the dish and its contained residue over the Bunsen burner, to drive off any combustible matter. Notice the residue of mineral matter. This experiment proves the presence in soil of mineral matter soluble in water.

A NUTRITIVE SOLUTION.—Make, or ask a dispensing chemist to make, the following solution :

Potassium nitrate (consists of potassium, nitrogen, and oxygen), 1 gram.

Sodium chloride (consists of sodium and chlorine), $\frac{1}{2}$ gram.

Calcium sulphate (consists of calcium, sulphur, and oxygen), $\frac{1}{2}$ gram.

Magnesium sulphate (consists of magnesium, sulphur, and oxygen), $\frac{1}{2}$ gram.

Calcium phosphate (consists of calcium, phosphorus, and oxygen), $\frac{1}{2}$ gram.

Water, 1 litre.

(A few drops of a dilute solution of sulphate or chloride of iron should be added.)

WATER CULTURE.—Fix two similar bean seedlings with clean corks in clean bottles, in the manner shown in Fig. 1. Let one bottle contain distilled water and the other the nutritive solution made as above. Cover the outsides of the bottles with rolls of brown paper to keep out the light. Notice that the first plant does not flourish, but that the second grows as well as in soil.

Vary the experiment by using nutritive solutions in which certain elements are omitted, and notice the effect upon the plants. For

example, calcium sulphate may be omitted and the calcium phosphate replaced by sodium phosphate. The plant will be then deprived of calcium only. Deduce, from the effects observed, the necessity of supplying lime, i.e., a compound of calcium, to soils deficient in calcium; and extend such considerations to the subjects of scientific manuring and rotation of crops.

GEOLOGICAL FORMATION OF SOILS.—Observe (e.g., in a quarry) the action of frost, &c., in breaking up rocks to fine particles. The distribution of soil by water, the action of earthworms in turning over the soil, and the part played by decaying leaves, &c., in the enrichment of soil by humus, also form subjects for interesting outdoor observation.

GENERAL BEHAVIOUR OF ROOTS.—The interest of the peculiarities noticeable in the behaviour of roots lies in their association with the duties of roots. In germinating bean plants notice the direction of growth of the radicle. Try to induce radicles to grow upwards or horizontally. Cut



FIG. 1.—Plant growing in a nutritive solution of salts. The bottle should be covered with a roll of paper to keep out the light.

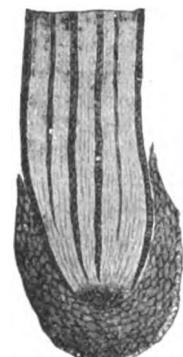


FIG. 2.—The tip of a root showing the root-cap (magnified).

off the tips of a few bean radicles, and notice whether the treatment interferes with their "sense of direction."

Hold up to the light the tip of a mustard radicle and observe the thimble-like root-cap (Fig. 2). Of what advantage is such a cap to the tip of a root making its way between particles of soil? Observe the method of branching of a bean root. In what order do the branches appear? How are the branches arranged on the sides of the taproot (developed radicle)? What is the general direction of growth of the branches? What is the advantage of this behaviour?

ABSORPTION OF SOIL WATER.—Counterbalance a small dish filled with soil which feels dry to the touch. Heat the dishful of soil in an oven for an hour, and then notice that its weight is less than before. Even in soil which feels dry to the touch, a thin film of moisture covers the surface of every particle. It is this moisture, with its

dissolved mineral salts, which is absorbed by the root-hairs clinging to the particles of soil (Fig. 3).

OSMOSIS.—Wet a piece of parchment paper or thin bladder (having previously held it up to the light to be sure there are no holes in it), and tie it tightly across the mouth of a thistle funnel.



FIG. 3.—Tip of a root-hair with adhering particles of soil. ($\times 240$.)

With a "fountain-pen filler" fill the head and an inch or two of the stem of the funnel with a strong solution of salt. Mark the level of the salt solution by a strip of label on the stem, and then put the funnel into a beaker of water in the manner shown in Fig. 4, and put the arrangement aside for a few hours. Notice that the salt solution rises in the stem of the funnel owing to the passage of water from the beaker through the membrane. Such an exchange, taking place between two liquids separated by a permeable membrane, is called osmosis. It should be noticed that the greater flow is from the weaker liquid to the stronger.

The experiment illustrates the manner in which the very dilute solution of salts in the soil passes into the interior of the root-hairs (which contain a much stronger solution), and thence reaches the root itself.

It will be understood that by osmosis the root-hairs and the region (the cortex) of the root in immediate connection with them are kept in a state of distension (turgescence), the contained "sap" being thus under considerable pressure. This is one of the principal causes of "root pressure."

ROOT PRESSURE.—In spring cut through the lower part of the stems of various vigorously growing plants (e.g., vine, scarlet runner, sun-flower), and notice the free escape of water from that part of the stem still in the ground:

GENERAL BEHAVIOUR OF THE STEM. (a) *Sensitivity to gravity.*—Notice the vertically upward growth of most stems—in direct opposition to the force of gravity. Place on its side a flower-pot containing a growing plant, and notice how soon the stem, thus rendered horizontal, once more assumes the vertical position.

(b) *Sensitivity to light.*—Observe the bending towards the light of the stems of plants grown on window-sills. Put a pot of seedlings inside a large box, at the closed end, the opposite open end being directed away from the window of the room. Notice that the stems of the seedlings become long, weak, and straggling, develop only small and very few leaves, and grow towards the dim light of the open end of the box. Grow other seedlings in total darkness, and write careful descriptions of their colour, size, and other peculiarities.

(c) *Sensitivity to contact.*—Place sticks ver-

tically in the ground by French or kidney bean seedlings. Time the period of revolution of the stem before it comes into contact with the stick. In what direction does the stem revolve? Describe any differences in the behaviour of the plant after its stem has come into contact with the stick. Similarly observe the behaviour of twining stems of convolvulus and hop.

THE PATH OF THE WATER CURRENT.—(a) Remove from a growing leafy twig a ring of about an inch of the bark and soft tissues beneath it, so as to expose the wood. Notice that the leaves above the ring remain fresh and crisp, showing that their water-supply has not been interfered with. The water must therefore travel along either the wood or the pith.

(b) Cut off a similar leafy twig and leave it in the sunshine with its cut end dipping into water coloured with red ink. Examine it after a few hours and observe that the wood is coloured red, while the pith is not stained. The water therefore travels along the wood.

(c) Similarly put a cut herbaceous shoot (e.g., of bean) dipping into coloured water, and after a few hours cut open the stem and see the coloured woody strands of conducting vessels.

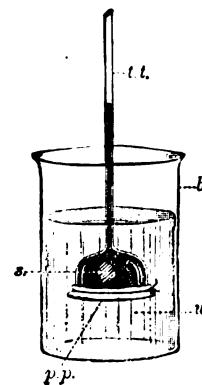


FIG. 4.—Experiment illustrating osmosis. *b*, beaker; *w*, water; *p.p.*, parchment paper; *t.t.*, stem of thistle funnel; *s.s.*, salt solution in head of thistle funnel.



FIG. 5.—Experiment to prove that green leaves, exposed to sunlight, give off water.

TRANSPERSION.—Take a piece of cardboard about four inches square, and make a small hole in the centre. Pass the end of a leafy twig through the hole and make up with soft wax any chinks between twig and card. Put the card on a tumbler containing water, so that the cut end of the twig dips into the water; and invert on the card—thus covering the leafy end of the twig—a second tumbler which is clean and dry (Fig. 5). Put the apparatus in the sunshine and look for evidence that the leaves are transpiring, i.e., giving off water vapour.

MEASUREMENT OF TRANSPERSION.—(a) Put the same quantity of water into each of two similar test tubes and let the end of a leafy twig dip into one. Weigh the tubes, place them together in the sun for an hour, then weigh again and deter-

mine the loss of water due to transpiration by the leaves. Repeat the experiment (b) in the dark, (c) in the sunshine after smearing the surface of each leaf with vaseline; and notice any differences from the results obtained in Expt. a.

STOMATA.—Plunge fresh leaves of various plants into hot water. Note and describe carefully any signs that the interior of the leaf contains air, and that pores (stomata) through the leaf-skin put this air into communication with the exterior. How does this observation throw light on the result of smearing leaves with vaseline in the transpiration experiment?

THE SOURCE OF THE PLANT'S CARBON.—It is common knowledge that more carbon (charcoal) can be obtained from an old plant than from a young one of the same kind. Notice the absence of carbon in the nutritive solution which has been found to replace satisfactorily the food taken up from the soil. The soil evidently need not contain carbon. The only other possible source of carbon is the atmosphere. Expose to the air a saucerful of clear lime-water. What evidence is obtained of the presence of a carbon compound in the air?

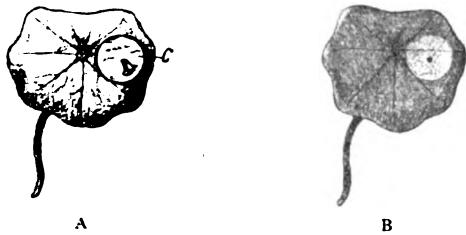


FIG. 6.—A, *Tropaeolum* leaf, on which have been pinned the halves of a split cork, c. ($\times \frac{1}{3}$). B, the same leaf tested for starch with iodine solution, after exposure to sunlight for an hour. The part shielded from the light remains bleached; the rest of the leaf has turned blue.

THE CONDITIONS OF CARBON ASSIMILATION.—The formation of carbonaceous compounds from the raw materials supplied by soil water and air respectively is called carbon assimilation. One of these compounds—starch—so constantly appears during the process, and is so easily tested for, that the conditions of its formation may be taken as the conditions of carbon assimilation generally.

The Necessity of Light.—(a) Pluck a leaf which has been exposed to sunlight for several hours, kill it by boiling in water for a few minutes, soak it in methylated spirit until the green colouring matter (chlorophyll) is extracted, wash with water, and then immerse in iodine solution. The production of a dark blue or purple colour with iodine is a proof of the presence of starch.

(b) Keep a plant in darkness for twenty-four hours, then pluck a leaf and test it for starch as in Expt. a. None can be detected. Any starch present therefore disappears in the dark.

(c) Cover with cork (or tinfoil) part of a leaf from a plant kept in darkness for twenty-four hours, and then expose to sunlight for a few hours. Remove the cork and test the leaf as before. No starch is present in the part previously covered; the rest of the leaf contains abundant

starch (Fig. 6). Because light is necessary for carbon assimilation, this process is also known as photo-synthesis.

The Necessity of Chlorophyll.—Expose to sunlight a variegated leaf (e.g., variegated geranium), and test for starch. None will be found in the colourless part of the leaf, but only in the portion coloured green by chlorophyll.

The Spectrum.—Decompose a beam of white light by passing it through a prism, and observe the band of colours produced.

The work of the chlorophyll of the leaf is to select from white light certain of the colours composing it, and put the energy of these colours at the disposal of the living matter (protoplasm) of the leaf. The protoplasm performs the work of carbon assimilation in virtue of the energy thus supplied to it. It should be borne in mind that chlorophyll itself is incapable of assimilation.

The Necessity of Warmth.—In winter prove that starch is not formed in the leaves of plants

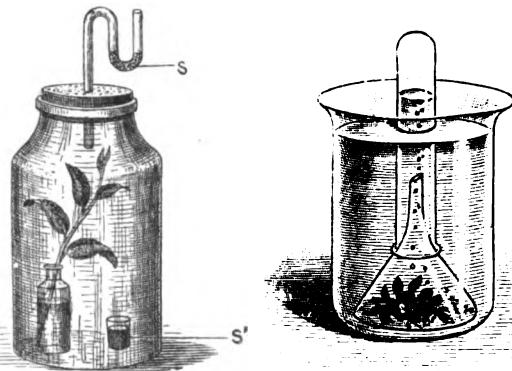


FIG. 7.—Experiment to prove that leaves do not make starch unless the air with which they are supplied contains carbon dioxide. s, tubes containing lumps of soda-lime; s', jar containing a solution of caustic soda.

FIG. 8.—Experiment to prove that green leaves supplied with carbon dioxide, and exposed to sunlight, give off oxygen gas.

in very cold air, even when they are exposed to bright sunlight. The intensity of light may be gauged by the time necessary to produce a certain standard tint with photographic printing-out paper.

The Necessity of Air.—Keep a plant in the dark for twenty-four hours, and then smear one leaf with vaseline to block up its stomata. Expose the plant to sunlight, and afterwards test for starch both the smeared and an unsmeared leaf. Explain the results observed.

The leaves of the bean and various other plants are covered by a waxy bloom which prevents them from being wetted by rain, and thus protects the stomata of their upper surfaces from being blocked by water.

THE NECESSITY OF CARBON DIOXIDE.—Fit up the apparatus shown in Fig. 7. In the bottle put a green plant or a leafy twig, which has been kept for twenty-four hours in the dark to free it from starch; expose the whole to sunlight for a few hours. Then test the leaves for starch; none

can be detected. As the plant is supplied with air which has been deprived of its carbon dioxide by the soda-lime and caustic soda, but is otherwise under normal conditions, the failure of assimilation must be due to the lack of carbon dioxide.

OXYGEN AS A WASTE PRODUCT OF ASSIMILATION.—Over an inverted submerged funnel holding a bunch of green water-weed invert a test tube full of water as in Fig. 8. The water used (e.g., tap water or river water) should contain dissolved carbon dioxide. Expose the arrangement to sunshine. Gas is given off in bubbles from the weed and collects in the tube. Test the gas with a glowing splinter of wood.

THE DISTRIBUTION OF LEAF-MADE FOOD.—Observe the effect of ligaturing a twig below the leaves, as by tying a wire or cord tightly round it. In such a case growth usually ceases in the part of the twig below the ligature, while the upper part of the twig grows much more luxuriantly than before. The food, made in the leaves, must therefore be distributed by the soft tissue, called *bast*, lying between bark and wood.

The foregoing experiments show that the food-supply of an ordinary green plant is entirely inorganic in origin. This should be contrasted with the organic nature of the food of animals. The plant raises matter from the inorganic to the organic level; the animal eats the plant.

THE PROBLEM OF MORAL EDUCATION.¹

THE batch of books before us suggests the three different lines by which teachers approach the problem of moral education. There is, first of all, the method of the Moral Instruction League, which subsectionises virtue and teaches it by compartments without any reference to a Divine Being or a Divine Sanction, or to a conscience within that shall be, as Cudworth puts it, "the best looking-glass of heaven"; there is, secondly, the method based on the doctrine and formularies of the Church; and thirdly, there is the method based on the teaching of the Bible.

"Can virtue be taught?" The question is as old as Socrates, and yet ever new. The answer of Socrates was that it was a matter of practice, not of teaching; that virtue could not be imparted, but was learned by doing. And,

indeed, it is clear that before the moral reason comes the moral law, the categorical "shall," and only in obedience to this law can come the moral enlightenment; by doing the will we learn of the doctrine. To take a small instance, the League gives a lesson on tidiness for infants under seven years; but the best education in tidiness for infants is a tidy home, a tidy class-room, and making the little six-year-olds themselves co-operate in securing and maintaining this tidiness. But, premising this, no one denies that habit and conduct are largely influenced by reflection, and that, over and above the instillation of right habit, it is the office of the teacher to make the child reflect, to induce what Dr. Arnold always regarded as the characteristic of the higher nature, moral thoughtfulness.

This may be done in different ways. Prof. Geddes adopts the Socratic way; by skilful questioning he leads his little learner to realise the difference between the great outside world of visible things and the far greater inward world of thought. Mr. Gould adopts the dramatic method; he is a good story-teller; he presents vividly before the child's imagination action noble and ignoble; then quietly, simply, effectively, not seldom superfluously, he points the lesson. One cannot help noting that, though any reference to God is rigidly tabooed, fairy stories are admitted; and one cannot help asking, amid all this parade of scientific method, whether it is possible to have an ethical science at all without a norm. The third method is the didactic, and that we have in Miss Gardner's "Letters to a Godchild," written to her at the time of confirmation, and putting before her the meaning of that step. The book is admirably clear, both in plan and in style, though it lacks glow and that abundance of heart out of which the mouth speaks. Mr. Burn's little book, "The Apostles' Creed," is also didactic, a valuable *Leitfaden* to the history of the creed of creeds, its meaning, and its bibliography.

Lastly, we have the books on the Bible itself. Dr. Kingsmill Moore takes the German method of literature teaching, as expounded by Mr. F. H. Dale in the 1896 volume of "Special Reports," and applies it to the Bible lesson. It is a most practical and helpful little volume, for the right method of Bible teaching is a subject which at most training centres is left to shift for itself—the price we pay for our ecclesiastico-political squabbling. Canon Newbolt's book is an attempt to apply this same method to the Gospel according to St. John; this is the most difficult Gospel to teach, and, for that reason, the help of such a book is the more welcome. Mr. Nicklin's book also gives help to the teacher where help is needed, for every year's discoveries throw fresh light on the origins of Israel; the volume is better written than its predecessor; it is up-to-date with its information, and well illustrated. Both this book and the book on Isaiah (chaps. i.—xl.) by Mr. Towers are suited to the senior classes of a secondary school. Dr. Bright's neat

¹ "Life and Manners." By F. J. Gould. 340 pp. (Sonnenschein.) 2s. 6d. net.

"The World Without and the World Within: Sunday Talks with my Children." By Patrick Geddes. 28 pp. (St. George's Press.) 6d. net.

"Letters to a Godchild." By Alice Gardner. 104 pp. (Ed. Arnold.) 2s. 6d. net.

"The Apostles' Creed." By Rev. A. E. Burn. 120 pp. (Rivingtons.) 1s.

"The Way to Teach the Bible." By Rev. H. Kingsmill Moore. 120 pp. (Longmans.) 2s.

"Old Testament History," Vol. I. From Abraham to Joshua. By Rev. T. Nicklin. 171 pp. (Black.) 3s.

"Israel and Assyria in the Time of Isaiah." By W. G. Towers. 155 pp. (Marshall Bros.) 3s. 6d.

"Handbook to the Gospel according to S. John, for the Use of Teachers and Students." By Canon Newbold. 156 pp. (Rivingtons.) 2s. 6d. net.

"The Gospel of St. Luke in West-Saxon, edited from the MSS." By Prof. J. W. Bright (of Johns Hopkins University). 143 pp. (Heath.) 2s. 6d. net.

"A Child's Life of Christ." By Mabel Dearmer. With illustrations by Eleanor Fortescue-Brickdale. 290 pp. (Methuen.) 6s.

little edition of the Gospel of St. Luke in Anglo-Saxon may perhaps take the place in the sixth form of a girls' school that the Greek Testament fills in the case of a classical sixth.

Miss Dearmer's task was not an easy one: to tell again the story of the Gospels is like painting the lily or gilding refined gold. One might find faults, such as the alternation in the same speech of the modern "you" with the old-world "thou," and the retention of the term "Woman" in our Lord's address to His mother. But, on the whole, the book is markedly successful; it avoids "journalese," it is free from tawdry rhetorical embellishments, it is suited to enter in at lowly doors. Of Miss Brickdale's illustrations it is not possible to speak too highly. They are full of power and suggestion: the blood-red, steel-shod spear that glitters up through the darkness from below towards the King as he hangs in triumph on the cross is a piece of speaking realism that marks the highest artist. It is a pity that the reproduction of these pictures is not as good as it should have been; the colours are not always in perfect register.

THE CHRISTMAS VACATION EDUCATIONAL CONFERENCES.

So many educational conferences are held annually during the Christmas vacation that it is impossible to find space for a full report of each of them. The following summary of a few discussions of real interest to practical teachers, supplemented by the abridgments printed in another part of this issue of certain of the addresses and by several "Items of Interest," will serve to direct the attention of readers to recent expressions of opinion on the teaching of important subjects of the school curriculum.

PHYSICAL EDUCATION.

The importance of securing the healthy development of the body in any scheme of education was recognised by the organisers of both the London County Council and the North of England conferences. In London a whole day was given to the discussion of organised games for girls and boys.

Mrs. Humphry Ward presided at the morning meeting concerned with girls' games, and said she was seized with an almost comic sense of the difference between this generation and the last, and her complete incapacity to join in the discussion so far as any personal experience was concerned. From the eighth to the seventeenth year of her life she was educated at a boarding school, but at that time the question of organised games for girls was the very last to which her teacher or herself applied her mind. She remembered a rapturous game called "tig" in a certain Shropshire school. Her afternoon exercise only meant the two-and-two parade, the long row of marching schoolgirls which George Meredith describes as the "Sunday dead march called a walk," when one was allowed "to shove the legs along, ironically naming it animal exercise." In the later sixties came the croquet craze, and ten years later the new ideas were spreading fast. The high school at Oxford had even then a cricket ground, where she had looked on in wonder at her younger sisters. The provision of organised games for girls is now becoming a settled and accepted thing. Some people perhaps may wonder whether our girls are not in danger

now of some of the excesses which are scolded in boys, whether girls' minds may not be too much set on games, and whether some of these games may not bring physical risk rather than physical gain. Concerted play disciplines those who take part in it. It curbs the domineering child, gives courage to the timid and self-conscious, and may be made a real school of manners and of grace. Mrs. Ward would like to see the town public authorities take the child's whole day into its consideration, play time and school time alike, and provide for both.

Miss Lawrence followed with a paper on organised games for secondary-school girls, the greater part of which we are able, with her permission, to print (p. 66).

Mrs. Kimmins, organiser of the Guilds of Play, also read a paper on the subject, and gave some account of the work done at the Bermondsey University Settlement. It has been found that simple dances arranged for children have a most beneficial effect from every point of view. The dancing of the varied forms of the minuet is in itself an education, giving self-control, grace of movement, courtesy of manner, and a hundred other things. Morris dances are the best for school purposes; there is so much action in them, and the attention of the child is maintained throughout.

Sir Lauder Brunton presided at the afternoon session, which discussed games for boys. In opening the discussion, he referred to the influence of hope and joy in enabling people to resist disease and in increasing the power of the mind. Joy and pleasure stimulate the muscles, and have also a powerful effect on the circulation. The first thing to remember is that physical exercises set for boys should be such as afford them pleasure. Games of ball are among the best physical exercises. Physical training is no good, however, if it stops at movements adapted to the training of the muscles. Sir Lauder Brunton would give boys a complete training in the art of rifle shooting. The playgrounds of this country, if properly utilised, would, he said, enable us to raise up a race who would be able to defend hearth and home against any invader. The less the teacher meddles with boys at their games the better.

Messrs. W. Corsie and F. Elton read papers, and the discussion was opened by Mr. T. Chesterton.

The physical condition of the poorer school children was the subject at one of the meetings of the North of England conference. The Bishop of Ripon, who presided, said we have been a little led astray in our educational enthusiasm, and have forgotten the primary condition of education—the preparation of the soil in which the seed is to be sown. Experts say that by overlooking the physical condition of children we have, quite unconsciously, been submitting them to overstrain, with the consequence of frequently throwing the physical system entirely out of gear. A careful physical inspection of the children is absolutely necessary, especially with regard to eyesight and hearing.

Dr. Arkle, of Liverpool, described how, in his own investigations of the physical condition of poor children his method has been to compare age for age the children of the council schools with the children of the secondary schools, the latter having, presumably, an opportunity of developing under the most favourable conditions. The result is to show quite an appreciable deterioration in the children even in the best council schools, and an alarming degeneracy amongst the poorest, and to prove, also, that underfeeding and neglect are the cause. The deterioration appears to grow greater as life progresses.

Yet, medically considered, the council-school children are with few exceptions what one would describe as a good, straight lot. They are dwarfed, maybe, in the poorer schools and starved, but there are very few cases of deformity or skin diseases, curvature of the spine, or crooked limbs; and as such they give one the impression that with better chances they would make a fine race of men. Over and over again Dr. Arkle has noted cases of children without an ounce of superfluous flesh upon them, with skins harsh and rough, a rapid pulse, and nerves ever on the strain, and yet with an expression of the most lively intelligence. But it is the eager intelligence of the hunted animal, with every faculty strained to obtain food; and it is from this class that the ranks of pilferers and sneak-thieves come. On the other hand, with children of a more lymphatic temperament, starvation seems to produce creatures much more like automata. They are in a condition of semi-torpor, unable to concentrate their attention on anything, and taking no notice of their surroundings if left alone.

Dr. Ralph Crowley, of Bradford, told how he has compared the children in the elementary schools in the best localities with those in the poorest in his city, and declared that he has found amongst the latter a very large proportion of children suffering from underfeeding. One of the most important facts is the serious deficiency in the children's diets of protein and of fat. The percentage of children who are below the average in mental capacity is more than twice as great among those of bad as among those of good nutrition. Of the children of exceptional intelligence, there are 62.7 per cent. of good nutrition, 35.6 per cent. below normal nutrition, and 1.7 per cent. of poor or very poor nutrition; while of the children who are exceptionally dull there are 24.9 per cent. of good nutrition, 39.5 per cent. below normal nutrition, and 35.6 per cent. of poor or very poor nutrition.

THE TEACHING OF MODERN LANGUAGES.

The subject of the first day's meeting of the London conference was the teaching of modern languages. Mr. L. C. von Glehn delivered an address on "The Direct Method of Teaching Modern Languages," in the course of which he urged that the essential condition of acquiring a language is to acquire that sense for it, that *Sprachgefühl*, which in every language is far more important than grammar. The pupil must, he said, act, suffer, and perceive in the foreign language—that is to say, he must be made to repeat the foreign expressions for what he does, suffers, and perceives. It is for the teacher so to select and systematise these translations of experience that the pupil learns at the same time the most common facts of grammar and the most useful vocabulary provided by each sphere or category of "experience." The aim of the direct method, he explained, is to move forward in and through the foreign language so far as it is possible without constant comparison with the mother tongue, such comparison being, as a rule, detrimental to all important direct association. One of the great advantages of the direct method is that it compels the teacher to foster in his pupils the habit of distinguishing between what they know and what they do not know; it is a discipline in intellectual sincerity.

Mr. D. Lloyd Savory dealt with "The Application of Phonetics to Modern Languages." He claimed for the application of the phonetic system to the teaching of modern languages that it gives independence. It makes the pupils to a large extent independent of residence

broad; and even if the learner intends to go to the country where the language is spoken, it is of great advantage to him to start with a thorough knowledge of the sounds in which he has to practise himself. Another advantage of the phonetic system is that it makes the pupil independent of the native teacher. The use of phonetics is a means of education, containing, as it does, all the elements of real education.

At the annual conference of the Modern Language Association several aspects of the work of modern language masters were considered. Mr. A. A. Somerville opened a debate on "Modern Languages in Civil Service Examinations," in which he urged that the examinations should be conducted so as to give boys the power of getting an insight into the language and some mastery too. It would be much better to confine attention to one language than to continue the present system. He suggested that the association should place on record a resolution that all public examinations should encourage the efforts made by modern language teachers to educate as well as to instruct.

Mr. Albert G. Latham read a paper on "Shall we Abandon Translation?" He said the fate of translation as a medium of instruction in languages is undoubtedly one of the chief questions at issue at the present moment. As for translation from the foreign language, he wishes to keep that more or less in its traditional form, but with more careful graduation of the texts and more insistence upon an idiomatic rendering. The texts should, he said, always be slightly in advance of the learner's attainments, and should necessitate an intelligent use of the dictionary; for, in spite of weighty opinion to the contrary, he still thought the older children should learn the use of the dictionary at school. The teacher should be on the alert to help the pupil to an appreciation of each word of his own language, and according as it is prosaic, poetic, archaic, humorous, or slang, should suggest an English word the use of which is analogous. The judicious use of translation is not only no bar to the requisition of a living knowledge of the language, but it is the surest way to an accurate knowledge of it; and Mr. Latham believes it is to be further recommended by advantages of its own. It is also an admirable means of developing and strengthening the command of English.

Prof. Rippmann introduced the subject of "Speaking Reform and Spelling Reform." He said that the spirit of reform is in the air, and amongst other reforms is that of reform in spelling and in speech. The ideal speech must be a perfect instrument for communicating thought. It must be clear and pleasing in verbal expression, and uttered in such a way that the manner of speech does not distract attention from the matter. We must strive after a manner of speech which possesses no unusual characteristics for the majority of the educated. There is no standard of speech in the North or in the United States of America. The only standard of speech we have any chance of recognising is that of the educated classes in the South, obviously not the speech of the lower classes, nor the London dialects, nor the speech of the aristocracy, but the upper section of the middle class. Here, too, there are distinctions—public speaking or declaiming and private everyday talk. The speech should be easily intelligible—one that limits the possibilities of simplification and that is pleasant, or at least not jarring, to hear. Speaking reform lies in the direction of making the standard more generally acceptable. This will best be done by influencing the young—teaching them their language on rational lines.

Speaking of the disadvantages of phonetic spelling, Prof. Rippmann remarked it is said that it looks queer, and that etymology is obscured; but etymology is a secondary consideration. How many words can the man in the street trace to their source? In reading and speaking does he give any heed to it? If phonetic spelling were adopted, would the student of etymology be inconvenienced? It could just as well be said that because our spelling is not that of Chaucer, Chaucer's English is unintelligible to us.

At the annual conference of the Association of Head Teachers, Dr. J. C. O'Connor gave an address on Esperanto. He said there are 50,000 students of Esperanto in this country, and that the total grammatical differences between Esperanto and English can be put on half a page of an ordinary reading-book.

INSTRUCTION IN CLASSICS.

At the meeting of the Headmasters' Conference, Mr. F. Fletcher moved a resolution, which was subsequently adopted, "That this conference is of opinion that the system of Latin pronunciation recommended by the Classical Association should be adopted by all schools represented on the conference with as little delay as possible." In moving the resolution, he said we are at present in the schools suffering from a want of uniformity in the teaching of the classics. It may seem a small matter how a dead language is pronounced, but it is of importance that a boy shall not be brought up to the age of fourteen using one kind of pronunciation, and after that be taught to use another. A system of this kind lends force to the accusation that Latin is dealt with really as a dead rather than as a living language. The time has come when there should be uniformity of system in the education of boys from the age of nine onwards, and not only from the time when they leave the public schools. He asked for uniformity first in the interest of the preparatory-school master, and next in the interest of the stupid boy.

The Rev. Dr. Upcott moved: "That, in the interests of the general education of young boys, it is advisable that the study of Greek should be postponed to the age of thirteen or fourteen, and that Greek should not be a subject of the entrance examination in schools represented on the conference." The resolution was eventually passed. Dr. Upcott's reasons for proposing this resolution were, he said, that the system of teaching four languages concurrently to young boys is bad in principle for all boys—whether dull, average, or clever—inasmuch as, in the first place, it dissipates the energy and confuses the mind of the learner at a period when clearness and concentration are above all necessary; in the second place, it tends to make the early education of a boy one-sided, giving undue prominence to languages and crowding out proper early grounding in such subjects as history, geography, simple teaching of natural science, and so on; thirdly, it tends to the neglect of the systematic study of English and English literature; and lastly, and perhaps mainly, it is highly uneconomical in a day when economy of time is of paramount importance. He said that there is a growing dissatisfaction with the methods of public-school training and an increasing desire to see a better, a more discriminating selection of subjects, together with greater economy of time, especially during the early years of boyhood.

THE TEACHING OF LITERATURE.

Opening a meeting of the London County Council conference which considered the question of the teaching of Shakespeare in schools, the Hon. W. N. Bruce, C.B.,

stated that when the Board of Education turned its attention seriously to secondary schools several years ago it found the subject of Shakespeare suffering from great neglect. Since then it has been doing its best, with the co-operation of the teachers and the school authorities, to secure (1) that the teaching of English shall have a fair proportion of time given to it in the curricula of school studies; (2) that the instruction shall be given in a continuous and progressive course, skilfully graduated to the age and capabilities of the pupils; and (3) that it shall be given on a method and in a spirit which will foster a lasting love of good literature in the children's minds.

Prof. I. Gollancz followed with an address on the teaching of Shakespeare in schools. We have in Shakespeare, he said, the greatest mind of England speaking to us in a form that is especially attractive from the standpoint of youth and childhood—namely, the dramatic form. He urged that the child should be taught to take an interest in Shakespeare in its earliest days, before it can read or write. He would start in the lowest form of the elementary schools with a story, carefully told, of one of Shakespeare's plays which is likely to interest the children. The boy or girl of ten could not be expected to master the whole of a play; the child should be so taught as to learn to care for the great and important parts of a play, and to recognise a complete work. It will be a good thing, too, if the Shakespeare put into the hands of the child has a *minimum* of notes. One of the first and important points in dealing with Shakespeare is that the children should learn by heart passages from the plays. The kernel of the whole matter is the question of repetition. Prof. Gollancz would like to see an annual festival in all schools for the enactment of Shakespeare's plays.

THE DEVELOPMENT OF CHARACTER.

At the final meeting of the Association of Head Teachers an address was given by Prof. Muirhead on moral and religious instruction. He said we have come to hold that no education that does not fundamentally affect and develop character is worth anything at all. What is important is not so much what we teach children, what faculties we seek to develop in them, but the use that the children are going to make of the instruction and the ideals with which they go forth in life. Some advocate the unconscious or indirect way of developing character; others hold that it must be distinctly conscious, and that the studies of the school should be arranged definitely with the view of the development of character; and others, again, advocate direct conscious, systematic, moral teaching. Prof. Muirhead emphasised the importance of the ethical and intellectual environment of the children, or what has been termed the "serenity of the work," its blithesomeness; for as a countryman of his had said: "The end of moral and religious instruction is to put us in good heart about life." While education must be rooted in unconscious imitation, it must also be nourished by conscious admiration. Hence the importance of selecting those studies which deal especially with what is admirable in human life. The main thing is not that there shall be direct ethical instruction, but that all instruction shall be ethical. It is this that people mean when they talk of "atmosphere." Any religious atmosphere is a good thing, and without it there will be little else but a stagnant vapour.

TECHNICAL EDUCATION.

The development of technical education in a large manufacturing centre was one of the chief subjects for discussion at the North of England conference. Principal

Reynolds and Prof. G. F. Charnock read papers dealing with the subject from different points of view.

Mr. Reynolds said that before we can even begin to discuss the subject of the development of technical education in a great industrial centre, we must first consider whether the provision for general education is liberal and effective. Unless this be the case, no subsequent technical education or training of any real value can be given. Even the humblest workers in the field of industry need the basis of intelligent training; however elementary that may be, they will be the better workers and the better citizens. It is fundamental, if this is to be done, that no child, on any pretence or excuse, shall be allowed to leave school until he has reached fourteen years of age. The number of scholars of that age in our elementary schools is but a small fraction of what it might and ought to be. Labour and half-time certificates, especially in Lancashire, are granted on the flimsiest pretext of knowledge, that the children may get to work; but it would be vastly better for the nation, where family necessities require it, that these children be granted maintenance scholarships until they reach the standard leaving age of fourteen.

He proceeded to put forward certain practical suggestions, which must be borne in mind in developing systems of technical education in our large towns. First, the need for the definite extension of the age limit in higher elementary schools to sixteen years. There is an advantage in selecting in each suitable locality of a town one of the elementary schools, and in giving it an extended curriculum, staffing and equipping it accordingly, such school to be fed from the elementary department of the school and from neighbouring elementary schools, and supported by a scheme of scholarships. Secondly, the enactment of a law forbidding the employment of young people in working overtime until they have reached their eighteenth year, so as to give full opportunity for attendance at evening classes. Thirdly, the establishment of one-day courses of specialised instruction in the technical school or college, now successfully carried on in certain centres, for selected apprentices in engineering and other similar important industries.

HEALTH IN SCHOOLS.

At a conference of the Teachers' Guild, opened on January 11th, the subject of health in schools was discussed. Miss Alice Ravenhill opened a discussion on "The Need and Opportunity for Systematic Observations and Records in English Schools." British investigations, she said, have so far covered but a very limited portion of the wide area which awaits intelligent survey. They are concerned chiefly with the physique rather than with the intellectual and moral growth of children, and lay more stress upon the conditions which multiply the abnormal than upon those which produce the normal, with which, after all, the teacher is primarily concerned. Children suffer to-day from the bad air in overcrowded or ill-ventilated schools; their food is often injudicious and unsuitable, while there is a serious deficiency of sleep among juveniles of all ages in all classes of society. Training in self-control is often wanting, and false emotionalism or excitement leads to exhaustion and permits a reckless waste of nervous energy and vigour. The yoke of competitive examinations is reflected in a perpetuation of cramming, which still, in some cases, stifles natural intellectual hunger; and morals are left to take care of themselves at ages when temptation is most active.

Dr. C. J. Thomas, assistant medical officer to the

L.C.C. Education Committee, observed that a large amount of the crippling defect of a preventable nature is at once apparent upon even a casual inspection of schools, while a careful survey invariably brings to light much more which otherwise would be unsuspected. Some of the defects are due to faulty hygienics of education; many are defects not primarily due to educational methods, but are detectable during school life and are capable of arrest in early stages by timely advice to parents. It is not too much to say that the yearly economic loss to the country due to conditions arising from teeth neglected and ill-cared for during childhood is considerably greater than the whole amount of the education grant.

Miss Ravenhill also read a paper on " Suggestions as to the Teaching of the Principles of Hygiene." She said that care must be taken to arouse interest in the many branches of hygiene, and in all cases the duties of personal hygiene must be stringently impressed. With boys, stress should be laid on the hygiene of occupation, while with girls the domestic side must necessarily take a prominent position. It is advisable to exclude so far as possible pathological details, to keep the ideal of a healthy, active physical life as a basis for success and happiness well in the foreground, and to impress facts by simple laboratory experiments, by actual observation, and by demonstration.

THE USE AND ABUSE OF PUBLIC EXAMINATIONS.¹

I.

By S. A. BURSTALL, M.A.

Headmistress, High School for Girls, Manchester; Member of the City of Manchester Education Committee.

THE system of public examinations, as we have known it in England, is peculiar to this country. It is of our own manufacture, and has been for the past fifty years one of the most characteristic features of our education. It has been developed in every grade, university, secondary, primary; characteristically English is it to give university degrees on examination only, as at the University of London, or by elaborate competition like the Cambridge tripos, which has given us the senior wrangler. "Locals" and other public examinations from 1858 have played a large part—too large a part many of us think—in our secondary schools, and our elementary education from 1861 was all but ruined for a generation through the deadly system of payment by results. The countries which are most famous for education—Germany, Switzerland, the United States—have no such systems of examination. The presumption is therefore against us; and we have nearly fifty years of recent experience from which to draw our arguments in attack or defence.

To-day there is a reaction; payment by results has disappeared; the best secondary schools minimise public examinations; and our northern universities stand, as the University of Manchester has stood throughout its existence, for the ancient mediaeval principle that the teacher's judgment and the student's record should be weighty elements in the award of university degrees. The whole subject, in short, is opportune to-day; and its far-reaching influence, its limits, its use and abuse, are indeed worthy of our consideration.

¹ Abridged from papers read at the North of England Education Conference, Bradford, January 4th, 1907.

Before attempting to analyse these, it may be wise to define the type of examination we have to consider. It is the characteristic English type we know so well—external, independent of the teacher and of the examinee's record of study, and largely written. The use, the necessity, of internal examinations, weekly, monthly, terminal, sessional, by the teachers themselves, to test the pupil's progress, knowledge, diligence, understanding, is so obvious as to need neither argument nor discussion.

What, then, are the uses of the other kind, the public and external examinations?

The first we shall consider is that which historically came first—to test the teacher, to raise the standard, to improve inefficient schools. It was invented, as has been said, because regular State organisation, aid, or control was contrary to public opinion in the mid-Victorian era, and because teachers had not a professional status. It was probably necessary then, and it certainly did good. It may again be necessary when, for special reasons, teachers cannot be trusted, or when any kind of State aid, inspection, organisation, or control is impossible through political or ecclesiastical conditions. The Oxford and Cambridge junior and senior locals undoubtedly had their uses, especially in girls' education; and the founders of the girls' public secondary schools, Frances Mary Buss and Dorothea Beale, eagerly supported and highly valued them in the early days. That stage has passed; public secondary schools no longer need such aids, such tests, though private schools may. With greater knowledge of what education really is, an elastic State organisation, wise inspection, local and central grants, and a register of efficient schools issued by local authorities—above all, with better teachers and a stronger professional consciousness—this need, this use, will become obsolete. Primary teachers have been freed from the bondage of payment by results. Their own standard of qualification may be raised, or they may be obliged to examine their own pupils elaborately. Whatever tests may be necessary for efficiency of their schools, it is not likely that its yoke will ever be bound on them again.

Secondly, examinations are a test of the pupil's fitness to pass on to something else. Such are those for the medical qualification, teachers' diplomas or certificates, ordination examinations, &c., which qualify for the exercise of professions; university matriculation or pupil teachers' entrance examinations, and the like. This use will always obtain. The history of educational institutions tells us that some kind of test of the individual pupil who passes to higher work is necessary. It tells us also what not to do. Such an examination must not be limited to paper work at a given hour on a given day. The examination must follow the teaching, not the teacher the examination; that is, the teacher must have some share in setting the questions. A moderator, or external examiner, is, of course, required to select questions from those set by the teacher, add new ones, bring in new ideas, and keep up the standard. The plan works easily if the examinations are really local; that is, not the same for the whole of England. Centralisation of examinations is bad; neither London, Oxford, nor Cambridge should examine all England. Each should have an area, as the Joint Matriculation Board has in the North.

Third is the use of examinations as stimulus to a pupil. The writer's experience of this has been only in secondary schools, but there such a use is often real and valuable. Idle and indifferent pupils do wake up and work at the prospect of a pass or honours in a public competition.

Will this use continue? Probably, yes; at least for English boys and girls in the next generation or so.

There is, on the other hand, a serious abuse of this stimulant, as of stimulants of another kind. A pupil learns to work only for examination, to care nothing for knowledge, but only for success, and to form an absolutely wrong idea of education. In the writer's experience in London this has happened again and again. Some pupils, too, are thus worn out physically and mentally before their life work begins. Such a danger may be met in part by reducing the number of examinations; once in a pupil's school career is enough, and it should be at the end, whether at fourteen, sixteen, or eighteen years of age.

Fourthly, examinations are most useful as a means of awarding posts in the service of the State or of distributing public money in scholarships and exhibitions. The Home and Indian Civil Service examinations and those for the Army have, on the whole, worked well. Our scholarship system is less generally approved, especially that for the great public schools, for college scholarships, and for scholarships from public elementary schools. Doubtless there are errors in selection and method, but on the whole the use of the system is greater than the abuse. A well-conducted examination does pick out the boy or girl who is worth the expenditure of public money, and does do something to exclude the unworthy. This aim is the more perfectly achieved if the examination is a test of faculty rather than of information acquired. English essays, translation of "unseens" in classics or modern languages, problem papers in mathematical subjects, are examples of such tests. The examining should be carefully done, should include oral as well as written work, and in many cases credit should be given for physical qualifications. A mere aggregate of marks should not be final in the award.

It is sometimes said that the examination system in the Indian Civil Service secures men who are clever and well behaved, but who do not possess the instinct of ruling; but probably no system would uniformly select suitable candidates only; a few unfit will get in whatever system be adopted. To this fourth use there are few abuses.

As regards the first, second, and third uses, namely, the test of teaching, the test of the pupil's fitness, and the stimulus, the abuse of public examinations has been in the past a serious injury to education in England, and the resulting evils in some quarters still persist. We all know how payment by results has injured elementary education; the evil it has done lives after it in mechanical methods, and the absence, too often, of the true idea of teaching and of learning. External examinations have injured secondary schools through the restraint they have placed on the teacher and through the enforced rigidity of the curriculum. Neither head nor assistant was free to try new methods, new plans, for the stratification and correlation of subjects. The pupils were limited and restrained, too, and their instinct of discovery and investigation replaced by the satiety which comes of cram.

External examinations are most harmful when they come half-way through a pupil's course of study; "junior" and "preliminary" examinations at twelve and fifteen years of age have been a sign of the weakness of English secondary education. Again, there has been a temptation to some authorities, even to universities, to examine for the sake of examining and for the monetary profit brought.

Furthermore, one of the most injurious results of the competitive-examination system has been that too often the wrong type of pupil has been brought forward—the brain that can assimilate and reproduce, not originate and think.

Examinations do often select able men—but not the ablest. The highest type does not take the highest place in such a contest: witness the Cambridge Mathematical Tripos lists. There are, indeed, folk who can pass examinations and do nothing else. Our English system, in some respects, has been on wrong lines, and has brought forward in the past the wrong kind of ability, a fact which has led the average Englishman to disbelieve in the good of education for practical life.

The abuse of examinations leads to another evil—the distortion of the student's ideas and of the notions of the general public. The student feels the same impulse and works for success, for the sake of getting ahead of the other men. Research, investigation, the increase of knowledge, the conquest of Nature by the application of scientific method—these have been set aside for what would pay in an examination. Thus it is that until recently, when there has been a reaction against the fetish, German universities have done much more in research than English ones. Our secondary schools (*alas!*) are still measured by their success in public examinations. Shall we ever see the time when on a prize day a headmaster or head-mistress will boast rather of the additions to learning made by the investigations and writings of members of the staff, as boast the yearly reports of the German gymnasia? The teacher who is still a student, who is still thinking and learning, is far more likely to make his pupils think and learn than is the poor pedagogue whose horizon is limited by the cram book and the question paper.

After all said and done, after the experience of the past and the lessons of other countries, the conclusion as to external examinations may be summed up in an old phrase: "A good servant, but a bad master." Such are examinations—useful, but dangerous. We are not likely to get rid of them, or to find anything else that will do their work. Like opium and strychnine, belladonna and arsenic, they are deadly poisons or beneficent drugs, according as they are used or abused.

II.

By J. E. BARTON, M.A.

Headmaster of the Crypt Grammar School, Gloucester.

A GENERATION ago it was assumed that the prime object of education was knowledge. Enthusiasm for science, in the most literal and bald sense of the word, was at flood tide. It was thought that the two most desirable qualities in a schoolboy were a thirst for information and a facility in reproducing it. Hence the enormous spread of public examinations. At the present moment we are enjoying a reaction from the somewhat uncritical worship of mere knowledge which marked the strenuous Victorian age.

Every really modern teacher, in his heart, is sometimes sceptical about the educational value, for many of his boys, of the particular thing he may be teaching at a particular moment. But nobody doubts the value of the process of learning as a whole if it is carried on in a vivacious, alert, and spontaneous fashion. A sympathetic inspector can soon gauge how far this valuable process is going on. Just as every school has its peculiar tone, so every class has a spirit, impalpable but recognisable, which emanates somehow from *these* boys when they confront *this* teacher, and depends comparatively little on what subject is being taught. It is just this spirit—incomparably the most important thing in education—which no public examination paper can capture. The youngest boy has a personality of his own, but the expression of personality by means of

ink and paper is an incredibly difficult art. Some of the greatest personalities have never achieved it. How, then, can we expect the average young boy, confronted with a set of printed questions, to reveal in his written answers any genuine part of himself? We know that in point of fact average boys really do differ, and differ enormously, in their attitude to a subject like history, in the interest they feel in it and the extent to which it enlivens their minds. Two hours with the class itself would be quite another story. These average boys would then emerge as individuals—more or less inarticulate individuals I dare say, but individuals none the less. Every teacher who has had young boys in his charge for a whole year, and then has read an outside examiner's report upon their work, is aware how curiously arbitrary such reports are apt to be. One reads them with an odd sensation, a feeling that the writer has not touched flesh and blood at all, that he is dealing with phantom boys and phantom school work. In short, if the object of a public examination is to test seriously the genuine education of the average young boy, one can only say that it misses fire. It is true that any examination paper you like will kill a few dunces, but this is no great achievement.

It is often urged that public examinations are at any rate good for the teacher. It is said they provide him with a definite line to follow, apply a competitive spur to his efforts, and make him feel that he had better be careful and industrious or else he will be found out. I confess I have little sympathy with that point of view from which teachers are regarded as a slippery class, who need to be kept all the time under a sort of police supervision. The sort of teaching which is goaded on the one hand, and cramped on the other, by terror of bad examination results is not likely to have much individuality or true educative value. And even if the incitement be only a positive one it is not without danger. In so far as a public examination lends itself to mere competition between schools, each school sending up a carefully picked and trained troupe of gladiators, the effect on education, properly speaking, is absolutely mischievous. The teacher under these conditions devotes his efforts, not to understanding the mind of his boys, but to anticipating the mind of the examiner.

There is something peculiarly vicious in the plan of selecting a handful of boys for spoon diet while their form companions, not candidates for the examination, pick up the odd crumbs. Unless that most important thing, the corporate form life, is to be sacrificed, boys should be sent up for public examinations in solid blocks, or else not at all. Possibly, like other commercial enterprises, the public examination has to keep its hold on the public by a system of prize coupons.

Examiners will urge that they, too, must live—an argument to which there is no reply except the callous one of Talleyrand to a vagrant who used it: "I do not see the necessity." If public examinations for junior boys are necessary at all, the results should be limited, in my opinion, to simple pass or failure, to a simple preliminary test of adequacy or inadequacy in the standard already reached prior to the broader and more serious work which is to follow.

A word on higher public examinations. At present, in the top forms of good schools, two objects have to be kept in view. It is necessary, first, that the average senior boy when he leaves school should carry with him some definite hall-mark of a reasonable all-round education. Secondly, it is necessary that boys of talent who aim at the university should win scholarships to take them there.

Any rational stranger, unacquainted with the inner working of schools, would imagine that these two objects, each a really laudable one, naturally stand or fall together; that the turning out into life of well-educated average lads, and the sending up to the university of well-trained scholarly lads, would merely be two aspects of one homogeneous process. Unhappily, this simple and rational idea is directly contradicted by the present state of things. The schoolmaster, for example, who is trying to equip his boys generally for the standard expected at the higher certificate examination, and at the same time, with the same set of boys, to provide a nursery of future Oxford and Cambridge scholars, already finds himself in a tight place, and every year the place becomes tighter. Every year the competitive examinations for Oxford and Cambridge scholarships demand a higher degree of specialism in one department. And every year the papers of the higher certificate demand a higher degree of specialism in all departments. The teacher thus finds himself distracted between the rival attentions of the upper and the nether millstone. If anybody will carefully compare the higher certificate papers of to-day with the papers of six or seven years ago he will realise what is meant. One must also admit that the governing idea of the examiner is a good one. It is distinctly a good idea to encourage independent thought. But independent thought, in segments of fifteen minutes a time, is a feat to which no wholesome schoolboy aspires. The question flusters him; he clutches vaguely at the first piece of knowledge which strikes him as dimly relevant, and writes even that inaccurately out of sheer panic. And so the examination paper, the proposed end of which is to elicit his knowledge, to lure it forth, takes from him even that which he hath. Why despise a simple paper? It is right, no doubt, to encourage the better kind of teaching, the less mechanical and more suggestive kind. But I venture to say that a simple paper, set more or less within the scope of any industrious senior boy, is far more likely to bring out the better and more original type of answer than the kind of paper I have had the presumption to criticise. Simple questions frighten nobody, but they are always quite hard enough to answer really well.

In order to justify more precisely the title of this paper, and to redeem it from the appearance of a mere philippic against examiners, I now ask by way of summary: Have public examinations any use at all, and how (incidentally) can their abuses be mitigated?

I have already made the familiar suggestion that some hall-mark of a useful school career is necessary. This end, which everybody, so far as I know, approves, is well served by a public examination for upper boys, provided the standard of it is well recognised by the public, and is not overlaid by any elaborate and distracting classification of honours. The important question of a leaving certificate lies rather outside our present scope, but at least one may say that a higher public examination, if it is to be really valuable, should be so framed as to provide a natural consummation of a long and equitable progress. It should be, I repeat, a natural consummation, and not what too often it now is—an exhausting nightmare for a summer term, a final and desperate effort sustained only by the thought that August is coming. A boy, if he has been a good boy, should be able to meet his higher public examination cheerfully, and not be compelled to "fall on death" (if I may quote a contemporary poet)

"Even as sobbing runners breast the tape."

If the inspector, who has personal knowledge of the school,

and if the schoolmaster, who has personal knowledge of the boy, can somehow be concerned in this examination without destroying its value as an independent and comparative test, so much the better. I will not go so far as to say that the independent examiner should always be a teacher himself, but I certainly think he should have had experience as a teacher, and if possible some fairly recent experience.

Are public examinations, even for younger boys, altogether bad? I think not. A simple test of the kind I have advocated, a plain examination with no baubles, has one very strong point indeed to recommend it. It confronts the youngish boy with a new experience. It has the distinct moral value of teaching him to rise to an occasion. If the justice of an examiner is often a rough-and-ready justice, the justice which life itself metes out is invariably rough and ready, and it is good for weak and strong alike to pass through an ordeal of this kind. Parents also are concerned. The sensible parent may legitimately wish to assure himself by some definite external standard that his boy is doing reasonably well at school, and may reasonably be left there. The vain, fond parent may very usefully discover that other people, besides the form master, cannot share the parental opinion about the offspring's genius. We all know also the good, rather stolid kind of lad who wins a good place in his class by daily marks, but is hopelessly floored in a comprehensive written examination. With this type of boy one has enormous sympathy; I believe he often becomes the very best and most useful type of man; but even for this boy the shock of a public examination is more or less salutary. As for the boy who is really glib at examinations, the boy who possesses the instinctive knack of putting all his wares in the window, it goes without saying that he gains by practice. We may despise the art of showing more knowledge than one really has, of deftly concealing joints in one's harness, but nobody can deny that it is a gift worth cultivating. It implies adaptability to environment, as followers of Spencer might say, and it is in constant request among lawyers, journalists, statesmen, and schoolmasters.

On the whole, however, I should say that the present tendency—the tendency to discount the absolute value of public examinations, to use them as a means rather than as an end, and, above all, to substitute the stimulus of an expert and sympathetic personal inspection for that desolating anxiety about paper results which has so often made the teacher feel that in the midst of life he is in death—is a good tendency. We must cheerfully acknowledge that at present the Board of Education (if one may say so without irreverence) seems to be adopting a policy, in this matter of public examinations, which is a really enlightened policy, a policy inspired by a broad and generous consideration of what school education really means. Apart from all arguments that can be set down on paper, experience and instinct assure one that to live in an atmosphere of public examinations, to breathe their air perennially, to be for ever babbling of them and straining after them, is thoroughly debasing. If we are to have public examinations at all, they should be tests rather than competitions. They should serve also as school examinations, so far as possible, occurring naturally in the normal course of the school year. Above all, their use should be strictly subordinate to a clear view of our ultimate object in school life—to bring out the possibilities, not of some imaginary typical boy, but of the actual boys, every one a unique specimen in his way, with whom we have to deal.

ORGANISED GAMES FOR GIRLS.¹

By M. LAWRENCE,

Headmistress of the Roedean School, Brighton.

To any who are devoting their lives to the bringing up and training of the young, it must have always been a very important problem satisfactorily to fill out and occupy the "out-of-lesson time." If six or seven out of the twenty-four hours are given to serious work, eleven to sleep and toilet, and two to meals, there still remain four or five hours which are unoccupied; and to the serious person who is anxious to train the good citizen the thought at once comes, shall those four or five hours daily in the young life be wasted and be allowed to take care of themselves, or shall they be utilised to the full?

The Anglo-Saxon race is, I believe, peculiar amongst other races in its very strong love for sport and outdoor life, and I suppose this is the reason that practical English men have long ago settled the difficult question by filling boys' leisure with elaborately organised games, which are made compulsory in all boarding schools and, I believe, in most day schools.

In pleading the cause of games for girls, I would put first and foremost as a reason in their favour that *they are, if rightly directed, a splendid means of developing character and bringing out what is best in children.* They teach the lessons so difficult to learn: that each one of them is only a part, and a small part, in the big game; that selfish play is bad form, unsportsmanlike; failure must be taken cheerfully and good-temperedly; and that it is of first importance that our opponents, as well as ourselves, shall have fair play. In the schoolroom our chief aim and object is to teach the child that she has an individuality—a thinking brain—to be developed; in the playground the child learns that she is one of a community, and that she must sink her individuality for the good of others. Education is incomplete unless both these lessons are learnt. The power of organisation and self-government, which is so readily learnt at games, becomes a very important factor in school life.

We all know that in a big school it is very important to secure a good tone. The only way to secure this good tone is to enlist the older girls on the side of law and order, for the mistresses to work through them and with them as friends.

In most large, well-conducted schools there is some system for giving the older, trusted girls authority over the younger part of the school. These girls often have a great deal of responsibility on them, and consequently have a great opportunity of developing character. They have to assume command, use tact and common sense daily, and yet learn to keep their places and not turn into little unnatural prigs. What better training can they have for their duties than the training of the cricket and hockey field, where everything must give way to the spirit of the game, and where one selfish and conceited person at once spoils the sport for all the others?

Another very good reason for advocating games for girls is that, quite apart from the actual good the girls get from them, they fill their leisure with an innocent and wholesome occupation, and leave very little time for gossiping and loafing and other undesirable things. The matches

are a never-ending topic of conversation, certainly preferable to the discussion of dress and worse frivolities.

Lastly, one would advocate games for their splendid physical training. I believe one half the diseases we poor mortals are subject to are brought about by want of exercise. Drilling, dancing, swimming, and walking are all very good; but it is a well-known fact, endorsed by all doctors, that free, pleasurable movements in the fresh air, accompanied by interest or excitement, have a value of their own which no amount of drilling in a gymnasium can supply, and long walks are, I consider, positively bad for most girls. The long crocodile walk of the boarding school which one used to see, but which, I am glad to say, has almost died out, was a particular abomination. The pace of all was necessarily regulated to suit the slowest walker; and to a person who naturally walks quickly I can hardly imagine a more tiresome and thoroughly wearying thing than to be forced to crawl along for an hour, probably the same identical walk, every day, term after term. The process is soul-killing as well as back-breaking.

I have often been told, on good authority, that when little boys first go to school quite 70 per cent. of them positively dislike cricket, and only after years of compulsory playing do they come to love it. This is, of course, the same with girls. A good many will tell you they hate all games. But it is precisely those girls who more particularly need their training: they are much too impressed with their own individuality; therefore it would be a very good thing if the games could be made compulsory in girls' schools. In a boarding school it is very easy to make games compulsory, but in a day school the difficulty seems to be very great. Quite apart from the fact that the school is very often situated in the middle of a town, and the playing field must of necessity be separated from the building by a more or less long train journey, and thus fitting in games with lessons becomes an almost impossible task; quite apart from that the games must involve a good deal of expense to the parent, who often is not overburdened with money; it is difficult then for the schoolmistress to insist. I believe, however, that the majority of high schools in England have playing fields and a more or less flourishing games club, and that in schools where the headmistress is keen, often 75 per cent. of the girls belong to it. Many schools have a regular games mistress, trained at such a place as the Dartford Training College or the Anstey College, Birmingham, who also teaches drilling and dancing. The duties of this mistress are to look after and help the girls to organise the games, and to be responsible for matters of health and to prevent the girls from falling into silly excesses. It is also a good thing to enlist the help and sympathy of the younger mistresses on the staff, as the games often develop a very friendly spirit between mistress and pupil, and this is a very great help to the good tone of a school.

There is, however, one very important point I should like to mention which has not received sufficient attention hitherto. While nearly every school has its playing field, very few have near it any house or pavilion in which there is a warmed room for girls to change in after their games. Every girl after playing should be made to strip and change her stockings and the garment next to her skin before attempting the home journey. I cannot imagine anything more dangerous than a girl's getting thoroughly hot, and perspiring freely, and then, without having changed, sitting, for an hour perhaps, in a draughty railway carriage on a cold winter's day. This is, of course,

¹ Abridged from a paper read at the London County Council Conference of Teachers, January 4th, 1907.

again a matter of expense; but it is a very important matter indeed, and neglect of precaution here has done a great deal to bring games into discredit. I should, therefore, be inclined in any school in which I had anything to say to stop games altogether until these conditions had been complied with.

A second important point to note is that often a slouchy walk and a bad carriage are brought about by games. If a weak-backed girl, who perhaps has done little or no exercise before, suddenly takes to hockey and cricket and overthrows herself every day at them, a figure which has been called the "games figure" is generally the result. The muscles of the back and loins are too weak to keep a good position when the body is habitually overtired.

The best way of dealing with this difficulty is first of all not to let a girl who is not very strong overdo games and stand in a bad position, perhaps for $\frac{1}{2}$ hours every day, fielding in cricket; and then the exercise of the games should be supplemented by scientific Swedish drilling and dancing. I say Swedish, as I believe this is the only well-thought-out scientific system which exercises the weak muscles in a body systematically, and supplements the movements of the games by strengthening those parts that do not come into play during the game. For instance, if a girl who is fond of bowling at cricket finds her right shoulder developing unduly, she should do some daily exercises for her left shoulder to keep herself straight. If a girl gets into a bad position while standing at cricket, she should work the muscles of the loins or waist to give herself strength to keep in a good position. A splendid corrective to a slouchy, ungraceful walk are the balancing exercises on the balancing bar. A corrective to sudden and ungainly movements of the limbs which arise from weakness are the graceful exercises taught in the dancing lessons. A girl who learns to dance a gliding minuet gracefully will soon learn to control her limbs.

These dancing and drilling lessons should be short, and, roughly speaking, be repeated as often as the girl plays hockey or cricket, so that every game which has a tendency to make her rough and throw her limbs about in an uncontrolled manner should be, as it were, counteracted by the regulated and systematic exercises of the drilling and dancing lessons. In this way almost perfect development would be secured.

The drilling and dancing lessons, which if well given are very popular indeed with girls, are best interspersed between the morning lessons, while the best time of day for the games seems to be about half an hour after the midday meal in winter and in the late afternoon in summer. It is ideal, of course, to let each girl have a game and a drilling or dancing lesson every day, and in a boarding school this is easy enough; in a day school I suppose the most that is possible is to secure a game and a lesson twice a week.

As to the games themselves, the three best games for schoolgirls are cricket, hockey, and lacrosse. Football is much too rough, and should never be attempted by girls. Cricket is better than lawn tennis, first of all because it is a public-spirited game, where each girl plays for her side and not for herself. Tennis has little educational value. Also tennis is the much more expensive game of the two, as it requires more ground; and to give a large school enough ground for tennis would be a very expensive matter.

Hockey has the disadvantage, if overdone, of producing a bad carriage; the attitude of the girl playing hockey is head well down and body forward, while at lacrosse the

body is generally erect, and the head constantly thrown back when the player is in the attitude of throwing and catching.

Lacrosse is rather the better game of the two, inasmuch as it requires more skill, and therefore is more interesting in the long run than hockey. But the best plan seems to be to have lacrosse during the autumn term and hockey during the term after Christmas. This change is a good thing, as it often gives different girls a chance of coming to the front.

I should like to say here that mixed cricket and hockey, for obvious reasons, are very undesirable. No girl can ever play at all like a boy, and serious accidents are often the result of these mixed games. Cricket for girls, amongst girls, is a very good game.

As to the games dress, the most practical arrangement is that every girl should wear a loose, short dress during school hours in which she can with comfort drill, dance, and play games, and this dress should be made, if possible, without a waistband, to prevent all possibility of tightness. Nothing can be much more injurious than to take exercise with anything on so tight that lungs and heart have not full play.

In conclusion, I would make an earnest appeal to all interested in education to do what is in their power to promote physical culture in its widest sense amongst girls. There is still some opposition to overcome. For one thing, the financial difficulty looms large before us. The British parent is not fond of putting his hand in his pocket for anything he does not consider necessary; but I must say this for him: when he is convinced he generally agrees that what is worth having is worth paying for. Therefore it is for us teachers to convince people and to prove to them that these games do much to produce the young woman we all admire—tall, well-developed, with a good complexion, a healthy body, and a healthy mind; one who is sensible and capable, able to take her place in the world and grapple with its difficulties in a true and sportsmanlike spirit.

HISTORY AND CURRENT EVENTS.

We are just now having lessons in the science of government from Asia—Mr. Naoroji, the president of the Indian National Congress, has been expounding the principles and methods of the British constitution. Either by quotation or from his own observation he expounds thus: "Good government can never be a substitute for government by the people." "All legislation is in the hands of the representatives of the people." "The whole life of England every day is all agitation." "The British people did not wait for their Parliament till all the people were ready." There has lately happened among us "a revival of the old and honourable principles of the seventeenth century," "of the true old spirit and instinct of liberty in the hearts of the leading British statesmen," "of the spirit, instincts and traditions of liberty and Liberalism," "of the old British love of liberty and self-government." Is this true? and what meanings are to be attached to the words "people" and "liberty," either with reference to the British Isles or to India where these words were spoken? Without such definition, the exposition is vague and hollow.

WE do not remember to have ever read a quainter item of news than the following: "A Chinese Imperial edict

has been issued raising Confucius to the same rank as Heaven and Earth, which are worshipped by the Emperor alone. It is believed that this edict has been promulgated in deference to the religious scruples of the Christian students in the Government colleges, who object to *kotow*, as required by immemorial custom, before the tablet of Confucius which is placed in all State colleges." There are several religions in China, and the Government of that country has pursued a policy of equal toleration for all. But such religions have been easy-going and mutually tolerant. Christianity, however, as in its beginning, is exclusive of other gods, and the Chinese Government has recognised this. But how quaintly, in our eyes. Confucius need not be worshipped; and this is effected by promoting him.

MR. BALFOUR, in a speech of criticism on the Government's method of conducting business, said: "Never before this Session had a Government depended so largely upon the amateur legislative efforts of unofficial members. Attempts to deal with great social problems or with great national interests in this way were to be deplored." This sentence would form an admirable text for a lesson on our methods of legislation. In the elementary histories of our youth, we were told that "if any member of the House of Commons thought of some new law, he proposed it in the House, and then," &c., &c., through the various stages of "readings," and the rest. We were never told that a private member had next to no chance of getting his proposal through, that it was only "Government" measures which had a chance of passing, and that this was effected by means of party loyalty, not by independent thinking and voting. But now a Government which adopts a "private" proposal on "great social problems or great national interests" is following a "deplorable" method. Are methods changing? or are our teachers knowing more?

A CONTINUOUS and reflecting study of mediæval history reveals the fact that the great desire of ordinary folk in those times was "good and firm government." Contrast the praise which the English chronicle gives to William I. and Henry I. with its blame of Stephen. The former are "good, no man durst do aught but right"; the latter is "soft," and anarchy and misery prevail. The House of Lancaster fell "for want of governance," and the Paston letters reveal a condition of private warfare on a small scale similar to the Wars of the Roses. Henry VII.'s legislation was directed to the suppression of "maintenance" and all its horrors. We have heard that in the United States of America government often fails before the brutal strength of trades unions, and the ordinary citizen suffers for "want of governance." And now in England a society called the "Labour Protection Association" announces that it is prepared "to provide its members with experienced men, who have served in the military, naval, or police forces, to counter-picket those who will use 'peaceful persuasion' towards non-union workmen."

MESSRS. F. E. BECKER AND CO. (Hatton Wall, London) have issued a patent flexible stencil, which enables students to produce in a few seconds perfectly symmetrical diagrams of the commoner forms of chemical apparatus. As a time-saving device it is excellent, and it may be recommended for the use of those students who are proficient in making good freehand sketches; but it is the very last appliance which should be entrusted to an incompetent draughtsman. The price of the stencil is sixpence.

ITEMS OF INTEREST.

GENERAL.

THE annual general meeting of the Headmasters' Association was held on January 10th and 11th. In the course of his presidential address, the Rev. Dr. G. H. Rendall said we are confronted by alternative courses, that of uniformity and variety. The convenience of officials and the framing of examination schemes, the enlargement of education areas and the centralisation of control, are, he holds, continually squeezing schools into identity of pattern, method, and outlook, and frowning upon individual experiment and enterprise. The alternative course offers the better way, the president thinks, namely, frankly to recognise variety, not uniformity, as the ideal; to encourage diversities of programme in schools of different type, different surroundings, and different constituents; to secure equality of opportunity for schools of unusual or even eccentric, as well as schools of normal, aim; to foster initiative in teachers, responsibility and independence upon boards of managers; to believe in the importance of diversity, experiment, and even originality; to tolerate, and when necessary to abet, resistance to the canker of examination, and the steam-roller of centralised administration.

NUMEROUS resolutions were adopted by the headmasters at their annual meeting. One resolution expressed hearty agreement with the amendment to Clause 25 of the Education Bill carried in the House of Lords, providing for the constitution of a registration council, representative of the teaching profession, and for a register which "shall contain the names and addresses of all registered teachers in alphabetical order in one column, together with the date of their registration, and such further statement as regards their attainments, training, and experience as the council may from time to time determine that it is desirable to set forth." It was subsequently resolved that as a substitute for attendance at a day or resident training college, work in a school recognised for the purpose, under the personal supervision of the headmaster, or a master of method under the control of the headmaster, might with advantage be allowed. A general approval was given to the recommendations of Lord Roberts's deputation for the military training of boys. It was unanimously resolved that in the administration of secondary schools by local education authorities the utmost care should be taken to avoid weakening the personal responsibility of headmasters, and that any attempt to encroach on the present administration of such schools by their governing bodies and headmasters should be resisted as being prejudicial to the best interests of secondary education. A series of recommendations for a scholarship scheme was adopted; the report of the Classical Association Committee on the pronunciation of Latin was approved; and a resolution passed declaring the remuneration of assistant-masters to be inadequate.

THE annual meeting of the Assistant-masters' Association, which now has a membership of 1,650, was held on January 11th. In moving the adoption of the annual report, Mr. C. H. Greene, the retiring president, alluding to the Richmond (Yorks) case, which raises again the old question whether headmasters are really supreme in their schools, declared that the Assistant-masters' Association is going to fight out this question to the bitter end. A large guarantee fund has been raised, and, if necessary, the case will be carried to the House of Lords. A resolution was passed welcoming the growing feeling of union

among secondary-school teachers, as shown especially in the formation of a Federal Council of Secondary-school Associations, and looking forward with confidence to the promotion by the council of a sound national policy in matters of education. Approval was expressed of the salary scheme for secondary-school teachers adopted by the London County Council, and of the fact that the Board of Education in its recently published report lays so much stress on the importance of increasing the present inadequate salaries of the teaching staffs. The reformed pronunciation of Latin was also approved. Dr. H. F. Heath, director of special reports and inquiries to the Board of Education, delivered an address on "The Place of Modern Languages in Secondary Education."

THE twenty-third annual meeting of the Incorporated Association of Assistant-mistresses in Public Secondary Schools was held on January 12th. A resolution having been adopted in favour of the establishment of an educational conference for the discussion of purely educational subjects, Miss Hodge, of Notting Hill High School, was elected president for the ensuing year. Miss Skeats, of Queen's School, Chester, the retiring president, in the course of her address, said the association has formed information committees to report on the action of the various local education authorities, upon whose activity the welfare of those who serve in the schools now depends. The framing of regulations for secondary schools by the Board of Education is a matter for serious consideration. Unless the association takes some action it seems possible that the levelling policy will become a fixed one. The principle that the same amount of time must be given to each grade of subjects during the whole of a child's school career is one that cannot commend itself to the practical teacher. There is great need, she continued, for the association to hold a watching brief for the curriculum in order to prevent overcrowding and ill-advised regulations, and to obtain far greater elasticity to meet the requirements of local conditions. There is an increasing tendency on the part of the local authorities to consider the conditions under which teachers are working in the schools, and the action of the London County Council has impressed upon others the fact that in many areas the salaries are not adequate. So long as a woman, after teaching for many years, may find herself stranded in middle life without the means of securing a competence, it can hardly be said that the teacher's lot is a bright one. Miss C. L. Thomson read a paper on the teaching of English.

THE first general meeting of the English Association was held at University College, London, on January 12th. The objects of the association are: To afford opportunities for intercourse and co-operation amongst all those interested in English language and literature; to help to maintain the correct use of English, spoken and written; to promote the due recognition of English as an essential element in the national education; to discuss methods of teaching English and the correlation of school and university work; to encourage and facilitate advanced study in English language and literature. Mr. Sidney Lee presided, and during the course of his address said the association advocates that, whatever other subjects are taught thoroughly, English ought to be taught thoroughly too. It is for the association to devise means of meeting difficulties in the way of realising this aim. There is an infinite deal for the association to do, as is obvious to anyone acquainted with the strides that English teaching and English knowledge are making through all the grades of

the educational system in America, in Germany, and, strangest of all, in France. It is a significant fact that at Harvard University, the oldest and one of the most active of American universities, there are twenty professors of English study in its various aspects, and at Oxford there is practically only one, and that the Oxford professor's pupils are for the most part not undergraduate members of the University, but women students, who, although they are not allowed any academic status at all, yet are ahead of their brothers in intelligent zeal for English study. In advanced English scholarship, America, Germany, and even France are outdoing England. Various resolutions determining the constitution of the association and the election of officers having been adopted, a successful meeting was brought to a close.

THE annual meeting of the Geographical Association was held on January 4th. The annual report for 1906, which was adopted, shows that a steady increase in the number of members has taken place during the year. While fifty-nine members were lost by death or resignation, ninety new members were added to the roll, making the total membership 535. This total includes the members of the newly formed branch in South Africa. The members now include teachers of every grade, school inspectors, and others interested in geographical education, both at home and abroad. A special committee of the association has been appointed to co-operate with a committee of the recently formed Historical Association. This joint committee will discuss syllabuses in the combined subjects of geography and history, and will draw up suggestions for a historical atlas for schools. It is one of the privileges of members of the association that they can borrow at very low rates view slides, many of which cannot be obtained by the general public. A catalogue of these view slides has been prepared. It was published in the Summer Number of *The Geographical Teacher* for 1906. A special committee on lantern slides has been appointed, with Mr. G. W. Palmer, of Clifton College, as honorary secretary. This committee is considering the whole question of lantern slides, how far it is possible to prepare series illustrative of certain aspects of geography, as well as of various countries. As soon as the work is sufficiently advanced, plans will be published for the exchange and purchase of slides and photographic prints. Teachers of geography wishing to join the association should communicate with the honorary correspondence secretary, Mr. J. F. Unstead, Goldsmiths' College, London, S.E.

AT the annual meeting of the Public School Science Masters' Association on January 12th, Sir Oliver Lodge spoke in favour of ambidextral training. He thinks there may be a tendency to overdo the quantitative side of science. In heat, practical work should be of this nature, but in electricity, measurement may well be postponed in favour of an early acquaintance with the simple phenomena. It is important to feed only the hungry, and not to stuff unwilling minds with information. He suggested that astronomy and physiology might be taken in schools, but the subjects should be dealt with, not in a technical manner, but rather through the biography of the discoverer. It is desirable, Sir Oliver Lodge said, to learn a science from both ends. In this way it is possible to utilise both the inductive and deductive sides of the subject. No educated man should be without a knowledge of the material universe; and though literature may be a better educational subject on the psychical side, it cannot give him this knowledge. Mr. Thwaites (Leicester) gave the

results of inquiries concerning the teaching of science in the public schools. It appears that about 60 per cent. of the boys take up science to some extent, and the average time allowed for the general course is four hours weekly. Mr. Leyland-Wilson (Charterhouse) explained that he teaches the atomic theory through physics. After a preliminary course of measuring and an elementary quantitative training in heat, the molecular idea is brought in to explain formation of crystals. Further work on the physical properties of air leads to a molecular explanation of the phenomena, and a similar opportunity occurs after constancy of composition and gaseous diffusion are dealt with. The atomic theory is only mentioned after a course of chemistry, which includes demonstration of multiple proportions and the laws of gaseous composition.

At a meeting of the Girls' School Music Union, held on January 11th, the recent memorandum of the Board of Education concerning the teaching of music in secondary schools was discussed. Mr. Walter Ford opened the discussion, during which the utility of the memorandum was widely recognised.

THE Rev. Dr. William Haig-Brown, formerly headmaster of Charterhouse, died on January 11th at the age of eighty-three years. The great achievement of his headmastership, which lasted from 1863 to 1897, was the transference of the school from London to Godalming. As a correspondent in the *Times* has recorded, Dr. Haig-Brown "gave the school the full devotion of his best powers; he identified himself with it; he knew every fragment of its history, and was ever 'jealous'—to use his own favourite word—of its honour and reputation. When traditions were harmful or retarded progress, he was fearless and would have none of them; but of whatever was good in the past he was the most faithful and considerate of guardians."

A HOLIDAY course for foreigners will be carried on at the University of London next summer, and will, as in former years, be under the direction of Prof. Walter Rippmann. The full course will last from July 22nd to August 16th. The number of students will be limited; students should, therefore, make early application, which in every case should be written in English. Tickets will be allotted as applications are received. Distinguishing features of the course are the lectures treating of English literature, institutions, education, and art; the systematic study of English phonetics; the classes for conversation, reading, and choral singing, conducted by trained teachers; and the organisation of excursions to places of interest in and around London. Arrangements will not be made for students who are only beginning the study of English, and have no conversational knowledge of the language. Details of the lectures and classes, and forms of application for admission and for accommodation, may be obtained on or after May 1st. All communications referring to the holiday course should be addressed to the Registrar of the University Extension Board, University of London, South Kensington, London, S.W., and the words "Director of the Holiday Course" should be written in the top left corner of the envelope.

THE tenth of the series of articles on public-school education appearing in the *Times* deals with laboratories, and is by the Rev. T. Nicklin, of Rossall School. Mr. Nicklin says: "It would be hard to find a single public school of recognised position that has not a laboratory which, if not palatial, is yet adequately equipped for that

end of science teaching that is regarded in England as educationally best." We are told later that "English public-school masters are not insensible to the danger of their old methods, yet see no sufficient evidence for making radical change. For, while adhering to the German theory that lectures and intellectual teaching must be the staple of the work, the English public schools have from the first made considerable use of the laboratory; and to-day that use is on a larger scale and more thorough in character than ever before." Many science masters will not agree that the kind of science teaching in all public schools is that "regarded in England as educationally best." With boys, lectures at all events should not be the staple of the work; and there is no reason why laboratory practice should not be highly intellectual. It would have been more satisfactory had Mr. Nicklin recognised more fully in his article the unique value of experimental work, and been able to report that this was the staple of the science work in our great schools.

AN essay on discipline, by Mr. J. L. Paton, formed the eleventh of the *Times* series of articles on public-school education. We wish every schoolmaster and schoolmistress in the country could be induced to study it. "The school's primary function is to teach the lesson and enforce the practice of obedience." "Respect for law does not come by nature; it must, therefore, be superimposed on nature by habit; right habit is a matter of enforcement and a matter of time." "No school is fitted to train for self-government which does not train its juniors to obedience, and its seniors, through its sixth-form system, to responsibility." "It is not right that the child's school life should be all gall and wormwood, but neither is it right that it should be all cakes and ale." Mr. Paton has many instructive lessons to draw from American experience in adopting fully the Rousseau theory of education, and concludes this part of his article by reminding his readers: "It is easier to relax the reins of discipline than it is to tighten them." We are sure no teacher will regret having secured a copy of the *Times* for December 29th, 1906, and having studied this essay.

THE twenty-third annual report of the Association of University Women Teachers shows that the total membership is now 1,648, of whom 246 ordinary members have been elected during the past year, the greatest increase on record in any single year. Of this number, sixty-six belong to Cambridge, twenty-two to Oxford, and sixty-eight to London University. Suitable applications for teachers received during the year numbered 353. Through the association 168 appointments were made. There has been considerable increase in the demand for teachers, both from public and private schools. Notwithstanding the large increase in membership, the demand for teachers is sometimes difficult to meet; and in certain directions the shortage in the supply of experienced teachers with good degree qualifications almost threatens to become acute. The demand for specialists continues; and the supply of teachers of natural science, mathematics, and modern languages has proved very inadequate to meet the need.

THE Education Committee of the Manchester Corporation is anxious to acquire a large Manchester estate known as Platt Fields. It is proposed to erect a training school with residential colleges for teachers, and to set apart some land as playing fields. If the Corporation should sanction the scheme, the Government contribution would cover 75 per cent. of the cost of the buildings and land required. This, it is reported, would mean a charge on

the rates of about a farthing in the pound. If the Council should agree to its purchase, negotiations will, we learn from the *Morning Post*, be commenced at an early date.

MR. SIDNEY H. WELLS, principal of the Battersea Polytechnic, has accepted the position of Director-General of the newly created Department of Agriculture and Technical Instruction for Egypt. Mr. Wells expects formally to enter upon his new duties in October next.

"THE Perse First Latin Book" by Mr. W. H. S. Jones, included among the classical books named in the list of "Most Notable School Books of 1906," published in our last issue (p. 21), should have been called a "First Latin Book." It is published by Messrs. Macmillan and Co., Ltd., and its price is 1s. 6d.

SCOTTISH.

THE annual congress of the Educational Institute of Scotland was held this year in Dundee. The congress programme was an exceedingly interesting and varied one, and not overloaded with items as is usually the case. The president, Mr. John Mudie, gave a thoughtful address on "The Moral Purpose in Education." During the past generation, he said, education has been chiefly concerned with the development of the intellect and the acquisition of knowledge, while the moral and spiritual side of child nature has been fed on the crumbs that have fallen from their table. The inevitable reaction has been a long time in coming, but it is here at last, and pupils of the present generation will be sent out to the battle of life much better equipped in their whole nature than their immediate predecessors have been. Principal Donaldson, St. Andrews University, attended to receive the honorary degree of F.E.I.S., and his appearance was made the occasion of a perfect ovation from the large audience to mark their appreciation of his life-long interest in education. The venerable Principal, in a delightfully reminiscent speech, said he was in a large measure responsible for inaugurating the idea of an annual congress. The original aim was thereby to discuss educational matters, and to bring closer together teachers of all grades throughout the country. Since that time a great gulf has become fixed between these different classes, and it should be the object of the institute to remedy this state of matters.

THE appearance on the congress platform of the Secretary for Scotland had special significance in view of the imminence (so it is hoped) of an Education Bill for Scotland. Mr. Sinclair was naturally somewhat vague and guarded in his remarks, but without any undue straining of his words it may be taken for granted this Session will see an Education Bill dealing with the medical inspection of schools, the feeding of school children, and the tenure and superannuation of teachers. In regard to the last, the Secretary for Scotland was as thoroughly sound as any teacher advocate. "If we are to attract to this noble profession men and women of the highest ability and capacity, we must look beyond the initial training to the ultimate conditions of service. To maintain the high standard that now exists, and to develop and improve upon it, we must ask ourselves whether the conditions of service as regards tenure and superannuation do not admit of improvement."

THE leaving certificate examinations are announced to begin on June 19th, 1907. In the accompanying circular, the Department strongly discourages the haphazard presentation of pupils in isolated subjects. Presentation in un-

related subjects has all along been the weakness of these examinations, and it is satisfactory to find emphasis laid on presentation for definite forms of group certificates. The only condition necessary for the success of the new scheme is that there should be a fairly wide choice of groups. Insistence upon uniformity of groups for all would be a retrograde and fatal policy for secondary education. Teachers should note that the formal essay is in danger of being displaced from its position of honour in the English paper. The essay has fallen under suspicion, because it may be employed, not for the sake of expounding knowledge, but in order to display ability in writing. This is true of much essay writing; but that is the fault of the teacher or examiner who sets a theme outside the scope of the pupil's knowledge. If the subject is carefully selected, no better exercise than the essay can be got within the scope of the school curriculum.

THE Provision of Meals Bill has failed to find a place on the Statute so far as Scotland is concerned, largely owing to the determined opposition of Sir Henry Craik. His action in this respect has been severely criticised, but his attitude on this question was in complete harmony with the whole body of evidence given before the Select Committee by Scottish witnesses. Whatever view one may take of the question, it is pleasing in these days of weak-kneed legislation to find one standing resolutely to his opinions in the face of an overpowering majority, and in spite of much obloquy and misrepresentation.

THE schemes of the County and Burgh Committees in regard to bursaries are coming in for a good deal of adverse comment. Dr. Struthers, of the Education Department, has submitted that of the Edinburgh committee to some pointed criticism. He thinks the whole system of awarding bursaries should be recast in order that more regard may be had to the varying circumstances of different candidates. Bursaries he regards as maintenance allowances, which should vary with the financial position of the parents and the actual outlay (for travelling expenses or maintenance away from home) of the pupils. An examination of the various schemes for grants to junior students brings out the fact that much more is offered by burgh committees than by county committees. The students under the former have no travelling expenses or maintenance away from home, yet they are, as a rule, in receipt of larger bursaries than their fellows in the country. This is due to allocating the money for this purpose largely on the basis of population. By this method large and wealthy areas have a surfeit of funds, while the sparsely populated and poor districts are starved.

THE long-drawn-out negotiations between the provincial committees for the training of teachers and the training colleges for the transfer of their buildings and staff have at length been completed. The Church of Scotland receives £15,500 for its buildings in so far as they are not governed by an educational trust, and the United Free Church receives £10,000 as its share, and is relieved of a considerable debt upon the college buildings. The protracted pourparlers are said to be entirely due to the dilatoriness of the provincial committees. This lack of business dispatch, together with many other evidences of want of grip on their part, does not promise well for the success of the new training Minute. The appointment of the directors of studies will, it is hoped, give the much-needed initiative and driving power to the new committees.

THE general committee of the Educational Institute of Scotland, at a meeting specially convened to consider the

question of superannuation, unanimously agreed to press during the forthcoming Session for a scheme of superannuation on the following lines: (i) That school boards be empowered to grant pensions or retiring allowances to all teachers in their service, irrespective of whether such teachers have accepted the Superannuation Act or not. (ii) That the Scotch Education Department shall contribute from moneys accruing to Scotland sums equal to those granted by the recognised educational authority—the total pension from all sources not to exceed forty-sixtieths of the retiring salary. (iii) That the Act be retrospective in the case of teachers who have retired since 1899. (iv) That the assurance principle be included with the pension principle, so that a grant may be made to the dependents of teachers who die in service. It will be noted that this scheme is to be supplementary to the existing scheme. Scotland has always claimed to be in a different position from England as regards pension. Historically the right to pension was always possessed up to the passing of the Act of 1898. By the present scheme Scottish teachers are merely seeking the restoration of their use and wont position in regard to retiring allowances.

IRISH.

THE school grant paid by the Intermediate Board of Education again shows a decided decrease; and when we consider that everywhere educational grants throughout the kingdom show a marked inclination to rise, it is clearly time that the Government should take this matter in hand. Mr. Bryce, who came to us with the reputation of a great authority on secondary education, did absolutely nothing for the secondary education of Ireland, and this in face of the fact that in 1906 the scale of grants dropped to almost one-half of what it was in 1903. The unit in 1903, i.e., the amount paid for a pass in the preparatory grade, was £5 17s., in 1904 it was £5 9s., in 1905 £3 16s., and in 1906 £3 2s. The fall is due mainly to the drop in the income of the Board. The Board has made an innovation, too, for 1906 in the comparative rates of payment; hitherto the rate in the junior grade has been $\frac{1}{2}$ that in the preparatory grade for a pass, and $\frac{2}{3}$ for a pass with honours; this year it is 2 for a pass and 3 for a pass with honours. As the proportion remains the same in the higher grades, this will benefit schools the pupils of which do not proceed beyond the junior-grade standard. Ought the Board to make these changes without explanation and without notice?

THE debate in the House of Commons last June, by which the proposed Rules for 1907 were rejected and which led to the Rules for 1906 being substituted owing to the impossibility of making the suggested changes in time, has had one salutary effect at least. The Rules and Programme of the Intermediate Board for 1908 have been published at an unprecedentedly early date, being issued at Christmas, while in former years they have never appeared until Easter. Whether the schools will be equally grateful for the other effects of the debate is very problematical. The point at issue was that Irish was not so favourably treated as other languages, e.g., French. This grievance has now been remedied; but, at the same time, the Board has entirely altered the Rules for passing its examinations, and has made them more stringent. In the preparatory grade the conditions remain the same, except that mathematics is substituted for arithmetic or algebra; but in the higher grades the four courses are abolished, and the following are the compulsory subjects: A, English; B, two of the following languages: (1) Greek, (2) Latin, (3) French,

(4) German, (5) Irish; C, mathematics; D, one other subject, which, except for those exempt, shall be experimental science.

THE changes go even deeper than appears at first sight. English, as a subject, is altogether changed. For the old subject of English literature and English composition, in each part of which 30 per cent. was necessary for a pass, we have the language, literature, and history of Great Britain and Ireland, in which 30 per cent. must be obtained as a whole, and in each grade a number of works is recommended merely "to be read"; what the nature of the examination in this subject will be is not apparent, and requires explanation. A pass in two languages other than English is a startling change, and means a raising of the standard, especially as the programme in these subjects remains of the same kind. Again, by a pass in mathematics is meant a pass, that is not less than 30 per cent., in each of the two papers in the preparatory and junior grades (these are arithmetic and algebra, as a single subject, and geometry), and in the middle and senior grades 30 per cent. in arithmetic and algebra and 30 per cent. in geometry or trigonometry. Girls may pass in mathematics by obtaining 30 per cent. in one paper. On the other hand, the amount of work prescribed in arithmetic and algebra and geometry is considerably less than in previous years. Temporary provision is made in languages for students who have already passed with one language only in any grade other than the preparatory.

OTHER important changes are as follows: The exhibitions are defined as of two classes, and their amounts stated; the four courses for exhibitions and prizes remain, but students may enter for them all, and are not obliged to choose one beforehand; the basis upon which they will be awarded is defined, starting from a standard mark to be obtained from the marks of the highest candidates. The special prizes for Greek and German are abolished, the rules for music are modified, and an intermediate school is defined as an educational institution which affords classical or scientific education in any grade higher than the preparatory.

AT the Dublin Education Society in December, 1906, a lecture was delivered by Mr. A. Murray on "The Problem of the Feeble-minded Child." The lecturer urged the necessity for special schools for the feeble-minded as a corollary to compulsory attendance, the ordinary elementary school being unsuitable for them, and their presence impeding the work of the other children. As Denmark and Germany had preceded us in compulsory education, so they had preceded us in providing special schools and specially trained teachers for the education of the feeble-minded.

AN important lecture was delivered in the Royal Dublin Society in December, 1906, under the auspices of the Dublin Sanitary Association, by Dr. Robert B. McVittie on "Education from a Physiological Point of View." Her Excellency the Countess of Aberdeen was present. The lecturer said the object of education is to develop man physically, mentally, and morally. The first function of the brain is to control physical vitality; hence its proportion to the rest of the body is much greater in infancy and childhood than in adult life. The evolution of thought and development of the reasoning powers should, therefore, be rather discouraged than stimulated in early life. Plenty of fresh air, good food, and abundance of sleep are absolutely necessary for the growing child. All teaching in the

early parts of life should be of a concrete nature. There should be no anxiety, fear, hurry, or effort to grasp abstract ideas. As these results followed inevitably from competitive examinations, they should be absolutely condemned in childhood and early youth.

WELSH.

SHOULD agriculture be taught in the elementary rural school? At a meeting of the Merioneth Education Committee, a resolution affirming the desirability has been carried. The special reason for the resolution is that agriculture and mining are the chief, if not only, industries of the county. Of course, the objection that teachers themselves do not always know the subject was recognised. But it was met by the answer that the principles of agriculture might then be taught by dictation lessons and reading from standard works. If it was said there was no time for agriculture in the curriculum, the reply offered was, again, that dictation and reading lessons would solve the difficulty. It was even argued that for the county schools, *i.e.*, the intermediate schools, agriculture would be more valuable than Latin or geometry.

It was distinctly stated that it was not proposed to add a single teacher to the staff. All that was suggested was to "use the machinery at our disposal." What was not realised was that to propose to alter the conditions under which teachers are appointed to teach the present subjects of the curriculum, by the inclusion of a highly technical subject like agriculture, would be to treat the whole body of teachers as a set of labourers who can be turned to any odd job, owing to the view taken of their work as unskilled. The method of teaching agriculture by dictation and reading lessons is almost as absurd as proposing to teach football or swimming by dictation and reading lessons. And if, as was suggested, it is hoped that Merioneth should "take a lead in this matter," and since the Education Committee is unanimous as to the desirability of undertaking the inclusion of the subject, it is to be hoped that the county will add more than "a single teacher to the staff," *viz.*, just as many teachers as are necessary to do the work adequately and effectively.

AT a meeting of the Governors of the Barmouth County School, a letter from the Central Welsh Board has been considered on the question of the teaching of Welsh. It appears that the languages taught in the school are Welsh, English, French, and Latin. One of the governors suggested it was ~~simply~~ a waste of time to include Latin amongst the subjects "in these days." The headmaster pointed out that the Welsh Intermediate Education Act compelled them to include Latin; and, moreover, it is a necessary subject for those who wish to enter on a college career. Of course, the schemes which are settled by authority give a security that subjects will be continued in schools. Otherwise it would seem to be probable that governing bodies, in their settlement of curricula, would make the intelligent teacher's lot not a "happy one."

AT present, in the examinations of the Central Welsh Intermediate Education Board, it is open to candidates to answer the questions in Scripture in either Welsh or English. It appears that only a small number accept the opportunity to use Welsh, and the Board is sending letters advising the schools to use Welsh in Scripture answers, and to use the Welsh language in the teaching of the subject. The headmaster of Llanrwst County School wrote to his governors on the subject as follows:

"I cannot say I quite agree with the proposal. It seems to me that the fact that many of the pupils in the Sunday schools have Scripture entirely in Welsh makes it more desirable that they should have some acquaintance also with Scripture in English to meet the difficulty of expression in English that some of them have. I have already told the boys who intend to do Scripture for me that they are welcome to put their answers down in Welsh if they wish, but I doubt whether many prefer it, and there are one or two pupils who would understand nothing of the lesson in Welsh. If the governors desire it should be done I can make arrangements for it, though I think it would be a mistake in many ways." It was decided to ask the Board to print the Scripture examination questions in both Welsh and English, but to leave the candidate free to answer in either language.

IT is rumoured that it is probable that at an early date a new department or sub-department for Wales may be expected in connection with the Board of Education.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Labiche, Le Baron de Fourchevif. (1) 70 pp. (Blackie.) 6d. (2) Edited by W. G. Hartog. 58 pp. (Rivingtons.) 1s.—Two editions of a farcical play (1) with *questionnaire*, sentences for retranslation, and a vocabulary (apparently complete); (2) with a few notes, *questionnaire*, passages for retranslation, misprints, and needlessly ugly pictures.

Cendrillon. By E. Magee. 31 pp. (Blackie.) 4d.—A fairy tale turned into a musical comedy; probably quite suitable for a girls' school. The introduction of Pierrot is a mistake from the artistic point of view; we prefer the simplicity of the tale as it is given in Perrault.

O. Feuillet, Vie de Polichinelle. 133 pp. (Blackie.) 1s.—This amusing account of Punch is here issued with quaint, old-fashioned illustrations, an ample *questionnaire*, and a vocabulary which is tolerably complete. The absence of notes is not a serious matter, as the text is quite straightforward. It may be recommended for cursory reading.

A. de Vigny, Histoire de l'Adjudant. Edited by C. Brereton. 34 pp. (Blackie.) 4d.—This pretty tale deserved editing; it is taken from *La Veillée de Vincennes*. Mr. Brereton supplies a biographical introduction, and notes in which the reader is asked to "note" all kinds of things. We in turn venture to ask him to note a few misprints: *la* for *le* (p. 8, l. 19), *faire* for *fait* (p. 10, l. 20), *de* omitted (p. 23, l. 23).

Choix de Poésies pour les Enfants. Rédigé par Mlle M. Humbert. 40 pp. (Blackie.) 4d.—It is not clear what *enfants* Mlle Humbert had in mind when she compiled this little volume of French poems. It is not likely that the child capable of appreciating *Trois jours de Christophe Colomb* will be interested in many of the earlier poems. The vocabulary in many cases is really quite difficult. If we had space, it would be tempting to compare the spirit in which French and English authors write for children. Do not the following lines seem terribly stilted? A child addresses a cat:

"Quoi, vous avez tué, d'une dent meurtrière,
Mon charmant favori? . . .

Que ce trait est cruel! ah! fuyez ma présence!"

E. Labiche and E. Martin, Le Voyage de Monsieur Perrichon. Edited by W. G. Hartog. 99 pp. (Riving-

tons.) 1s.—There is no introduction to this popular comedy, not even a list of the *dramatis personae*. The text is not free from misprints, the strangest of which is *Madman* for *Armand* on p. 36; we have no space to enumerate such slips as *la jour*, *viola*, *faiset*, *menières*, &c. The editor also supplies French notes, questions on the text, and passages for translation, as in the other volumes of this series. The illustrations are depressing.

Histoire d'un Chien and *Le Vilain Petit Canard*. Edited by W. G. Hartog. 66 pp. (Rivingtons.) 1s.—We can hardly keep pace with this indefatigable editor; indeed, to judge from misprints, he is always in a terrible hurry. The first short story is by Mme de Witt; the second is the famous tale by Andersen, considerably simplified and shortened. The notes, here as in the rest of the series, would be more valuable if the exercises were based on shorter sections of the text, and if there were more practice in applied grammar and word-formation. The vocabulary seems to be practically complete.

Classics.

Sophocles' Antigone. Translated by Robert Whitelaw. With Introduction and Notes by J. Churton Collins. 1+56 pp. (Clarendon Press.) 1s. net.—We have already noticed an earlier number of this series of books, and expressed our opinion that it will not do what is expected of it. The editors expect, no doubt, that such books may form part of the English work of schools, and so give something of Greek literature to those who are brought up on the modern commercial system. We do not believe that commercial schools will look at a translation from the Greek, at least from the Greek drama. Where the translation is itself a genuine part of English literature (as with the Elizabethans), there is a strong case for it, and such translations, if reprinted, may possibly be adopted in classical schools for their modern side or for young boys and girls; but Mr. Whitelaw's translation, good as it is, has not yet this claim to recognition, and the drama is that part of ancient literature which is most difficult to appreciate without a knowledge of Greek language and antiquities. It is really impossible to get at the heart of Greece by translations. But those who know Greek will enjoy this translation, in its austere and cold finish, far removed from the sentiment and the formless extravagance of modern verse. The lyrics, unfortunately, are not a success; but the blank verse is very good, as scholars already know. Mr. Collins has added explanatory notes, and a long introduction, on the life of Sophocles, his place as a poet, and the plot and problems of the play. Little of this belongs to the play properly. Such a series as this ought to have its general introductory volumes, or pamphlets, and as little as possible in each section, nor anything which is not to the point.

The Frogs of Aristophanes. Edited, with Introduction, Commentary, and Critical Notes, by Dr. T. G. Tucker. Ix+276 pp. (Macmillan.) 3s. 6d. net.—This is an exceptionally good edition of its kind. It is permitted us to consider it from the schoolboy's point of view, and from that point it contains a great deal too much; but it is just the book for anyone who has to "get up" the "Frogs," and excellent for the teacher. The whole book bears evidence of independent thought and judgment, and it contains a number of novelties in text or commentary which deserve the attention of scholars. In the introduction the editor discusses the political and literary bearings of the play, both, and especially the second, being of

some importance. He gives reason to think that the play was brought out at the Lesser Mysteries at Agrai, not the Greater at Eleusis. Finally, he has a valuable essay on the language and metre of comedy, from which much may be learnt. His text is sound and conservative, but he has adopted a few changes which are almost all, we think, improvements. A new point is given to v. 570 by assigning it to Dionysus, instead of to a supposed second πανδοκεύτρια. The MS. ήκειν is defended, successfully we think, in v. 1157; and great care is taken with spelling and the forms of accidence. In 957 the editor conjectures ἐπιν for ἐπᾶν, an improvement certainly, but not supported by evidence. The notes contain a great deal of good Greek (see, e.g., those on 97, 265, 565, 607). On the other hand, our old friend δέος reappears, whom we thought dead and done for, in the explanation of οὐ μή (202), and the note on 554 is not convincing. The explanations of allusions and jokes are full and good, and a new point is seen more than once (e.g., 121). There is, however, a fanciful vein in the editor, which leads him to vain guessing; he suggests, for example, that Αὐαίρος λίθος in 194 may be a hit at an assumed person, Αὐαίρος, who sat in the seat of the "stone-bearer" which exists in the theatre! Several other little romances of this sort are given.

Thucydides, Book VI. 30-53 and 60-105: the first part of the Sicilian Expedition. Edited for beginners in Greek, with Introduction, Notes, Vocabulary, and Maps, by Percy Ure. xxiv+184 pp. (Murray.) 2s. 6d.—In reviewing the first volume of this new series we expressed our regret that the series had not been intelligently planned, and we are forced to repeat our criticism. This is not a book for beginners at all. Beginners know no Greek, and they cannot learn the elements of Greek from any such book. Those who have learnt the elements, and have come to the text of Thucydides, ought not to have special vocabularies provided for them. In this book the notes are full of the elements of grammar, scraps of translation, and, in fact, nearly everything which the learner ought to do for himself. To learn Greek on such a system is to exercise little more than the memory: thought and reason hardly come into play. We are sorry that we must condemn the book, but we can see no good purpose served by its publication. It shows a reaction to the worst characteristics of a type which we hope is doomed to extinction.

Blackie's Latin Texts: Virgil, Aeneid, Books V., VII., VIII., IX., X., XI., XII. By S. E. Winbolt. *Caesar, Gallic War, Book I.* By W. H. D. Rouse. Each 6d. net.—These books of Virgil complete Mr. Winbolt's edition of the Aeneid in this series. We have already reviewed the other books; and our review called forth a letter from the general editor, Dr. Rouse, defending certain points and promising emendation in others. We do not propose to argue again as to expediency of marking without comment certain vowels long of which the quantity is doubtful or probably short, like the *a* in *magnus* and the *i* in *misceo*; we prefer to note that the spelling in the present books is much improved; we cannot, however, but regret that the opportunity has not been taken to correct the glaring mistakes in printing in the introduction to the Virgil. This is the same in all twelve books; and if it is proposed to emend it in a second edition, why not have begun at once in these more recent volumes of the first edition? We heartily approve of the principle of these texts; and in pointing out shortcomings, our only object

is to improve them. For example, improvement might be made in the punctuation, especially when we remember these books are intended for beginners, e.g., in Book XII. in vv. 25, 81, 503, 655, 688, 708, 728. There are numerous misprints and those we have noticed have been sent to the general editor of the series.

Dent's Latin Primer for Young Beginners. By Edward S. Forster. xvi+135 pp. Dent's Modern Language Series [sic]. 1s. net.—From the introduction we gather that this book is meant for very young persons. Here we find our first difference with the editor. He ought to have in his mind a complete scheme of education, in which Latin should find its proper place; but he does not say anything definite on this head, only implies that the learners are so young as to be addressed in a childish style. Now we think that Latin ought not to be begun as a class subject before the age of twelve or thereabouts. Then, again, the beginner should begin Latin, in our opinion, as he should begin any other language, without being troubled as to technicalities—"First declension" and so forth. He should have sentences—complete thoughts expressed in Latin—long before he knows the numbers of declensions. The subject-matter of his work should be such as is near to his knowledge; not "Minerva erat dea sapientiae," or "Benevolentia Alexandriæ gloria Britanniae est." The pronouns, which he wants from the very first, are here found in Exercise 33. At the end of the book is a "Phonetic Transcript," in which *Italia* is allowed to have a short initial, *tabella* to be pronounced with a single *l*, assimilations of final *m* to the succeeding initial are made to complicate a difficult subject (*sapiential laudant, benevolentiar reginae*), and *j* is used for the sound of *y*. The book has been written by someone who wants to agree formally with the writers of text-books on French, but has not used the class-room as a corrective. The book is quite unsuited to beginners on any reformed system of teaching, and equally unsuited to those who teach from books. Pictures do not redeem a lack of intelligence in its compilation.

English.

The Interlinear Bible. (Cambridge University Press.) 12s. 6d.—This is an admirable edition, showing not only at a glance, but, so to speak, *currente oculo*, the variations between the 1611 and the Revised Version. It is quite possible to read either version aloud without being troubled to change the direction of the eye or to run the risk of losing one's place. An illustration will show at once this comparative method. Two important verses are chosen:

And the Lord added to them day by day those that were being saved.

^{13:5} But I know that my redeemer liveth,

^{11:11} For I shall stand at the last day upon the earth:

And though after my skin hath been thus destroyed

Yet from my flesh shall I see God.

Besides this the variant translations are placed at the foot of the page. The book is at once a comment on the good work of the Revisers and a vindication of the A.V.

John Bunyan's Life and Death of Mr. Badman, and The Holy War. By Dr. John Brown. viii+432 pp. (Cambridge University Press.) 4s. 6d. net.—As an addition to the series of English Classics now being issued from Cambridge, this is worthy of attention; and two

of Bunyan's works which are not by any means well known to the general public find at last a worthy editor, and are presented in a form which will command respect. As a faithful reproduction of the original text, no praise can be too high for these pages, and the introductory note supplies all the necessary information which scholars require. The volume is a bulky one, but inasmuch as it brings into currency texts which entitle Bunyan to a high place among those who have used our English tongue most worthily, it completely justifies its existence.

Précis Writing. By H. Latter. 214 pp. (Blackie.) 3s. 6d.—This book is intended for Civil Service candidates and for Army classes, and it has been compiled in order to meet the needs of those who felt that the first series, which was published in 1903, did not contain sufficient examples. The aim of the compiler has been to put together in the two books thirty exercises, as being a reasonable number to work before examination. In this second selection they have all been used at Woolwich and Sandhurst already, and deal in the main with diplomatic correspondence. May be safely recommended. Teachers, it should be noted, may obtain a key.

A Selection from Sir Joshua Reynolds' Discourses. By Prof. Findlay. xiii+216 pp. (Blackie.) 2s. net.—Sir Joshua Reynolds achieved a masterpiece of literature in his Discourses, not one whit less important than some of his masterpieces in painting, and these lectures have been several times of recent years included in popular series. The idea of making a class-book of them is a new one, and Prof. Findlay has carried it out happily and successfully. This is a book well worth the serious attention of all who are interested in the teaching of English literature.

Miss Yonge's Book of Golden Deeds. Part II. By H. H. Watson. 137 pp. (Macmillan.) 1s.—This is an addition to the Secondary Schools series of English Literature. The worth of Miss Yonge's work certainly makes its inclusion in this series quite fitting. Miss Watson's notes, questions, essay subjects, glossary, and index are extremely well done and highly praiseworthy.

History.

A History of Modern England. Vol. V. By H. Paul. vi+408 pp. (Macmillan.) 8s. 6d. net.—In this volume Mr. Paul completes his task, and supplies an index to his five volumes. The period covered is the decade from 1885 to 1895, those confused years during which Mr. Gladstone and Irish questions occupied the main attention of English people. Mr. Paul treats it as he has treated the previous forty years. He is never far away from the House of Commons, even in his treatment of foreign affairs, except perhaps in his short chapter on the triumph of ritualism. The general effect is, therefore, that of a good newspaper account of the events from day to day, written from a mildly cynical and not altogether impartial point of view. If we were asked for advice as to the books to be read in order to get a good working idea of England in the latter half of the nineteenth century, we should recommend, first, Mr. Paul's volumes for the surface history, and then Prof. Dicey's "Law and Public Opinion" for the philosophy of the matter. In one respect at least the two books would form a remarkable contrast. In Mr. Paul's it is all a struggle between political parties. In Prof. Dicey's, if we remember rightly, the words "Conservative" and "Liberal" do not once occur.

Our English Towns and Villages. By H. R. W. Hall. 198 pp. (Blackie.) 1s. 6d.—This is a pleasantly written historical account of English local life, treating mainly of institutions and architecture. There are several good illustrations, and a summary of each chapter. The story begins with the earliest inhabitants, and extends to the present day, though the later stages are very briefly treated. The only fault we have to find is that the chronological order is not always observed, and some confusion naturally results. And "folkland" is not public land.

Historic Links. By D. L. Maguire. xii+308 pp. (Swan Sonnenschein.) 6s.—The sub-title describes this book as "topographical aids to the reading of history." Its fourteen chapters contain sketches of social and political life, connected with topographical sketches. Its period is mainly mediæval. There are sixteen photographs and an index. Young people will get profit from the reading thereof, its accuracy being guaranteed by the help that Mr. Hubert Hall has given to the author. But its language is not attractive. There is too much writing down to the level of younger children than would be likely to read it.

Medallions from Early Florentine History. By E. Underdown. viii+253 pp. (Swan Sonnenschein.) 5s. net.—The preface says this book is not intended as a complete and detailed history of Early Florence, but an account of certain of the more striking and important events, and that greater prominence has been given to the more romantic and picturesque side of the historical narrative. To this it may be added that the "medallions" are not confined to Florentine history, but wander into Sicilian history as well. They are eminently readable, and, so far as we can judge, accurate.

Empire Builders. By W. K. Stride. x+109 pp. *British Colonization and Empire.* By F. A. Kirkpatrick. xvi+115 pp. (Murray.) 2s. 6d. each.—Both these books are published under the auspices of the League of the Empire. Each consists of six lectures intended to be read to audiences of young people. Those in the second book are intended to be illustrated with lantern slides, a list of which is given with instructions for their use. They are both well written. The first treats of Alfred, Drake, Clive, Wolfe, Hawke, and Cook; the second, of the story of the gain and loss of our Empire, 1600-1783. Not only is the story told, but morals are drawn. Indeed, our only doubt is if the matter is not too weighty for oral delivery as it stands, and whether it would not be better to take the hint in one of the prefaces and use them as materials for lectures.

We have received a pamphlet entitled "Scottish History in Our Schools," accompanied by a "handbook" of the publishers thereof, the Scottish Patriotic Association. Their object seems to be praiseworthy—to see that Scottish history is not misrepresented in text-books written south of the Tweed; but we think they would do well not to magnify so much what is apparently their pet grievance, that King Edward has called himself VII. The numeral is, of course, historically incorrect, but—*de minimis non curat lex.*

Geography.

A Progressive Course of Comparative Geography. By P. H. L'Estrange. 148 pp.; numerous pictures, diagrams, and maps. (Philip.) 6s. net.—The mainspring of this distinctly ambitious work is "education, not instruction."

To this end the numerous illustrations—whether pictures, maps, or diagrams—as well as the text matter, are subordinated, and questions and exercises are inserted at every corner. We have no hesitation, then, in saying that the book is written on the right lines. It remains for the teacher who uses it—and he must know his subject well—to see that his pupil understands it, a task which, we think, will here and there require a fair amount of patience and a considerable amount of knowledge. The work is mapped out for six terms under the headings: (i) Principles of Geography; (ii) British Isles; (iii) Europe; (iv) North America and Asia; (v) Central and South America and Africa; (vi) British Empire. To enable the book to be used in all parts of the school, a system of lettering has been adopted. Thus the juniors read only the parts marked A, the middle school A+B, the seniors A+B+C. A progressive and concentric system, if a little complicated in its workings, is therefore provided. The maps, accompanied by test maps, correspond to these divisions by means of coloured type; brown names are for A boys, brown+blue for A+B boys, and brown+blue+red for A+B+C boys. This arrangement, by the way, seems quite to upset the orthodox look of the maps; we think that red would have been the better colour for A, i.e., that section which contains the map facts of primary importance. The maps are simple, brightly coloured, and accurate, though we notice one example of carelessness in the omission of signs localising the mountain peaks of South America. All the world maps are drawn on Mollweide's equal-area projection. From the practical teacher's point of view, the main criticism we have to make is that the language is too advanced and the subject-matter too condensed—certainly for the A boys. As a matter of fact, the style and diction adopted for the seniors is pretty much the same as for the juniors. In the preface the "imaginary schoolboy who begins in the lowest class" is alluded to as naturally learning only the parts under the heading A. It depends what is meant by the "lowest class." There is no need of imagination to picture schoolboys of the ordinary lowest class who will make neither top nor tail of these parts. But begin the book with boys of, say, thirteen years, and it should go fairly well. With the help of a good and enthusiastic teacher they will work the exercises intelligently and satisfactorily. The whole idea of the exercises is, we feel confident, excellent. No map is given without problems set on it; no picture is drawn without questions on its meaning. That some of these problems and questions involve too long answers, and that some of the pictures are so indistinctly printed that we are afraid teacher and taught will alike be nonplussed, are details which do not affect the value of the book as a whole. Certainly we recommend teachers to obtain a sight of it. It is full of valuable suggestions, excellently simple maps, and capital studies for home work. Whether its awkward shape (11½ in. x 9 in.) and weight (nearly 3 lb.) will militate practically against its use for class work is a moot question. Boys to use it will have to be sitting down.

Mathematics.

Junior Practical Mathematics. By W. J. Stainer. x+350 pp. (Bell.) 3s.; with answers, 3s. 6d.—The book is divided into two parts; the first part deals with arithmetic and algebra, the second with geometry, but the two parts are intended to be carried on together. Pupils who use the book are supposed to be under the guidance of a teacher, and theoretical discussions and explanations are therefore reduced to as small space as possible. In the

preparation of the book attention has been given to many of the recent suggestions as to work for beginners in mathematics; the exercises are very numerous, and seem to be in general suitable, though some (for example, those of set 168) will require considerable help from the teacher.

Geometry. An Elementary Treatise on the Theory and Practice of Euclid. By S. O. Andrew. xiii+218 pp. (Murray.) 2s.—In this revised edition the plan of the book has been somewhat changed. The first seven chapters contain a course of practical geometry, including trigonometry; though proofs are frequently suggested in these chapters, it is only at chapter viii. that formal deduction is begun, and in that and the following chapter the leading theorems of elementary geometry are discussed. Some theorems on solid geometry and a discussion of the mensuration of the simpler solids are given in chapters xi. and xii. There is much good and suggestive matter in the book, though we think some of the proofs might be improved.

Trigonometry for Beginners. By J. W. Mercer. xi+351 pp. (Cambridge University Press.) 4s.—This text-book has been prepared under the conviction that there is "no reason why boys should not begin Trigonometry quite early, provided that they are not hurried through the preliminary stages"; the various trigonometrical ratios have been introduced gradually, their meaning and use being illustrated by easy problems rather than by identities. The first ten chapters are devoted to the development of methods of solving triangles, no trigonometrical knowledge being required beyond that of the simple definitions. The treatment of the subject in these chapters is excellent; very great stress is laid on good methods of carrying out and checking solutions, and the problems, which are very numerous, are both sensible and varied. The graphs on pp. 37-39 are very instructive; the graphical methods illustrated on pp. 281, 289, deserve even greater prominence than are given to them, as they are of great value to the advanced student, and are at the same time, in our own experience, interesting to the pupil. These first ten chapters are so good that it seems ungracious to offer any objections to them; but we think that perhaps too much space is given to the solution of triangles before coming to the general formulæ. The rest of the book is more theoretical, and includes a discussion of the general definitions of the ratios, the addition theorem, identities and equations, and the like. Though not so copiously illustrated, the discussion is thoroughly sound, and forms an admirable introduction to more advanced treatises. If treated on the lines and with the thoroughness of this book, trigonometry may be safely begun at an earlier stage than is now customary in good schools.

First Steps in the Calculus. By A. F. van der Heyden. vii+216 pp. (Arnold.) 3s.—This little book, in accordance with recent practice, makes no hard and fast division between differentiation and integration, and does not confine its illustrations and applications to geometry. The treatment is based on the method of limits, and is usually simple and clear, though we think that the discussion of infinitesimals, good as it is in some respects, might be improved without sacrifice of simplicity. The range embraces the differentiation and integration of the ordinary functions, applications to geometrical and mechanical work and to infinite series, including Taylor's and Maclaurin's theorems. While the inclusion of infinite series will be of service to some students, we hardly think it suitable

for beginners, unless, indeed, these have had a good preliminary training in somewhat advanced algebra. The book contains more than its modest title indicates, and should be distinctly useful as an introduction to the calculus; students interested in examinations will find sets of questions drawn from recent Board of Education examination papers.

Science and Technology.

Physical Optics. By Prof. R. W. Wood. xiii+546 pp., with coloured frontispiece and 325 illustrations. (Macmillan.) 15s. net.—During the last fifteen years considerable progress has been made in extending our knowledge into the more obscure regions of optical theory; the two best books dealing with this aspect of experimental physics are Drude's "*Lehrbuch der Optik*" and Schuster's "*Theory of Optics*"; but Prof. R. W. Wood's volume comes in as a good third to these well-known books. The great charm about Prof. Wood's book is the clearness and lucidity of the explanations, and the description of interesting and often wonderful experiments by which difficult points in optical theory can be made clear: many of these experiments were in the first place devised by Prof. Wood. Those students who have mastered the general theory of optical phenomena will find Prof. Wood's book indispensable to their further progress. Recent advances in magneto-optics, fluorescence and phosphorescence, the laws of radiation, the scattering of light by small particles (including optical resonance), the nature of white light, and the relative motion of ether and matter; these, among other interesting branches of optical theory, receive adequate notice. It goes against the grain to find fault with a book which, in most particulars, is so admirable; but it must be mentioned that in some parts of the book the printer's errors are so numerous as to cause great annoyance, if not confusion, to the reader; as one instance out of several, the mathematical theory of "surface films," developed on pp. 296 to 303, may be mentioned.

Sound and Rhythm. By W. Edmunds. 96 pp. (Baillière, Tindall, and Cox.) 2s. 6d. net.—In his preface the author suggests that, as so much time is wisely spent in the teaching of singing in our primary schools, it would be well to impart to the children some knowledge of the mechanism of sound and of hearing. The seven chapters discuss the nature of sound, waves of sound, musical scales, organ pipes, "time" and movement, the ear, and the voice. The range of subject-matter is so extensive that it is impossible for the treatment to be thorough, and valuable space might have been saved by the omission of four full-page illustrations which show the sequence of positions of a boy and girl waltzing, and are by no means essential to the text. The author's explanation of the telephone and microphone transmitter (p. 7) is woefully in error, and this should be rectified at the earliest opportunity. Apart from these defects, the book will be interesting and instructive to those who require a slight knowledge of the subject. Teachers might read it with advantage, but it is not suitable as a class-room text-book.

Light. By F. E. Rees. 166 pp. (Dent.) 1s. 6d. net.—This book is intended for students reading for the intermediate examinations of a university who already have some acquaintance with elementary experimental optics. Comparatively few experiments are described; but, apart from this, the subject is treated in a very satisfactory manner. The volume is well illustrated and well printed, and it will be found quite trustworthy for the purpose for which it has been prepared.

Miscellaneous.

Character Building. A Collection of Aphorisms and Maxims, Original and Selected, with Notes. For School and General Use. By A. H. Angrave. 62 pp. (London : Educational Supply Association, Ltd.) 6d. net.—The compiler suggests that these aphorisms and maxims should be committed to memory, and frequently revised, if the best results are to be obtained. We are a little sceptical as to the value of formal attempts to build up character, and should prefer to adopt the indirect method, which unostentatiously avails itself of the opportunities that present themselves in the ordinary routine of school work. As the booklet reminds us, "Conduct is three parts of life," and the watchful teacher will never be at a loss to know the right moment at which "to point a moral." Children are rarely influenced by "preaching"; but those who understand them know how easily their faces are set towards the light. Yet Mr. Angrave's compilation will be welcomed by many teachers.

Children's Books.—We have received from the Aldine Publishing Co. the first three books of the "Wideawake Series" of sixpenny readers—"Little Red Riding Hood," Grimm, and Hans Andersen. They are well got up, well edited by Dr. M. T. Yates, and are cheap. "The Arabian Nights," "Robinson Crusoe," and "Stories of Animal Life" will follow. From Messrs. Horace Marshall and Son we have received four numbers of the Little Ones' Library—"Blue Beard," "Mother Hubbard," the "Snow Queen," and "Puss in Boots." They are in get-up and illustration parallel to the famous "Books for the Bairns," but the covers are more attractive. We may be mistaken, but we feel there is a growing opinion that the horrors of fairy tales should be toned down. There is so much that can be used, and used well, that the more revolting parts of ancient and mediæval folk-lore need not be presented to little children. Few people would think of printing what is called the Ur-Cinderella. On this ground we think "The Sleeping Beauty" and "Blue Beard" require a little more editing. Mother Hubbard, for the first time in our recollection, seems to be taken from a fashion-plate, and is Young Mother Hubbard. From Messrs. Nelson come two books, both excellent—the "Wild Life of a Field, an Introduction to Nature-Study" (6d.), and the "Tale of Odysseus" (3d.), edited in scholarly fashion by Mr. E. Haig Brown. The notes are surely for teachers only, and as such might with advantage take up more room. Children need no notes; teachers need as many good notes as they can get. Messrs. Chambers send an interesting booklet (2d.), the "Young Canadians," and Messrs. Blackie's "Model Reader," Book IV. (1s. 4d.), is well up to the standard of this admirable series.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

A Civic Museum and its Educational Aspects.

DURING January a number of educational conferences were held in London. Perhaps a noticeable feature of these conferences was their being held in different parts

of London, each in a separate accommodation. Thus the Medical Examination Hall accommodated one, the College of Preceptors another, the hall of a City company yet another. This diffusion of meeting-places means but one thing. Though its future prosperity must depend mainly on its increased regard for education, London—the chief city of the Empire—has done nothing to provide a suitable centre for educationists to meet annually in congress. The need of the establishment of a centre which would bring together workers in every field of educational activity is generally recognised, and movements have been started to remove it.

There is one movement in particular to which I may perhaps be permitted to refer. For some time past I have been giving my time and attention towards initiating the attempt to establish a civic or municipal museum in one or more places. This museum is designed to afford exceptional educational possibilities. In this connection it aims to present to the educationist a summary of all the known particulars of the structure and composition of the city; a synthesis and analysis of its history and geography; a visualised reconstruction in minute detail of place, work, and people, by means of maps, charts, pictures, diagrams, bibliographies, &c.: to supply illustrative materials for practical educational work, especially that dealing with the history of the city and those geographical, occupational, racial, governmental, ecclesiastical, and other conditions which determined its past and present and may influence its future: to guide teacher and student to the vast educational resources of London, in schools of art, science, and music, in museums, parks, gardens, &c.: to collect and disseminate new conceptions, new ideas and ideals, to control and direct new activities in education: to provide administrative bodies with an advisory council of experts in all departments and sub-departments of educational knowledge: to be a congress hall that would serve to organise the most favourable conditions for educational conferences, a centre for the largest gatherings.

Further, such a museum would seek to afford precisely the data needed for a comparative study of educational problems, and thereby serve to indicate cause, effect, and possible solution. Thus its collection of plans, drawings, and designs would afford not only a historical survey of educational institutions, but a view of what is being done in the present towards a rational adaptation of the university, college, school, and residence, to the needs of those who work and live in them. Its historical documents would furnish a record of what the great education movements have done in the past towards the improvement of the race, and its general collection of facts, photographs, diagrams, graphics, &c., presenting the lives of great cities, would afford a comparative view of different systems of education and the relative effectiveness of their present attempts to improve the physical, mental, and moral conditions of the individual and the community. Apart from this, since unity and organisation of thought and action are the main objects of the museum, it would tend to break down destructive isolated effort, to bring together unattached societies and workers, to give reality to federation movements, to afford opportunities of associated life and studies. In short, it would constitute that organising brain, that co-ordinating centre which, once established here in London, would by its example and its impulse give rise to similar centres throughout the Empire.

As I intend to expand my general scheme so as to accommodate it to the difficulties of the average reader, I

should be glad of criticisms of it in its educational aspect. Especially I should like to know:

(a) Whether in the opinion of any of your readers the establishment of an institution designed to serve such educational purposes as I have outlined seems desirable and feasible.

(b) Whether there is anything else that can be suggested for its improvement in particular or in general. That is, what other data or accommodation educationists would demand of it.

(c) Whether the scheme could be placed before the chief educational associations in England and Wales with a view of its being profitably discussed.

I should mention that the memorandum of the scheme in its civic aspect is being included in the new volume of Sociological Papers shortly to be published by MESSRS. Macmillan and Co., Ltd.

HUNTLY CARTER.

c/o Social Service Institute, 11, Southampton Row, London, W.C.

Experiments on Liquid Pressure.

EXPERIMENT I.—*To prove that the pressure exerted by a liquid varies with its "head."*

Apparatus: A burette reading 50 c.c.; a watch with a second hand.

The experiment is worked by two pupils, one doing the chief part of the manipulation, the other recording the time. If they are members of a junior class, it is well to begin by teaching them to read the second hand of a watch. Apart from the difficulty presented by the passing of the hand beyond the sixty-second mark, there is need to make them familiar with the various marks and numbers, so that they may not be puzzled about them during the experiment.

The burette is filled with water right to the top. Then the pupil who is working the experiment says "Ready" to the time recorder, and turns the stop-cock about three-quarters on: the water runs out easily, but not too quickly. As the bottom of the meniscus passes the zero mark, he taps on the table with a pencil, and his helper records the exact second. He taps again as it passes the 16, 32, and 48 c.c. marks, and each time a record is made of the second at which it passed.

The general result is quite clear. It takes a longer time for the water to flow from 0 c.c. to 16 c.c. than from 16 c.c. to 32 c.c., and longer for the second third than for the last. From this the conclusion is easily reached that the pressure of the liquid, as shown in forcing the water out at the bottom, varies with the *height* of the column. This is all that can be deduced from the experiment. For a more exact measurement it would be necessary to read to fifths of seconds.

EXPERIMENT II.—*To prove that the pressure exerted by a liquid varies with the density.*

Apparatus: The same as in the first experiment.

This experiment is worked on the same lines as the first. The burette is filled up to the top with water: the stop-cock is turned full on, and the time which the water takes to flow from 0 c.c. to 50 c.c. noted. The same thing is then done, using alcohol or some other liquid of a lower specific gravity than water. The stop-cock is turned full on in both cases, because only in that way can we be sure that *equal* quantities of water and alcohol are being used.

If the bore of the burette tube is wide enough to prevent capillarity phenomena from interfering with the easy flow of the liquids, a result accurate within the limits imposed by reading time only to the second may be expected. Thus,

in one experiment where the water ran through in twenty-one seconds, the alcohol took twenty-four, giving the density of alcohol seven-eighths that of water. This is near enough to establish the general principle that the liquid of greater density exerts greater pressure, and therefore runs through more quickly. If greater accuracy were wanted, it might be got by reading to fifths of seconds. Probably, however, the method is most useful for demonstrating in a concrete way a general proposition which is quite valuable apart from an exact numerical basis.

Glasgow.

WILLIAM BOYD.

Is a Duodecimal System Possible?

THE question of the Metric System is very much in the air at the present time; and some of the opponents of its adoption in this country have raised the very curious objection that the Decimal System is inferior to the Duodecimal System. As there must be many who do not properly understand what the term "Duodecimal System" implies, a few explanatory remarks may not be out of place. It is fairly well understood, of course, that our present system of notation, or enumeration, has for its base the number ten. In this way a number such as fourteen is expressed by one ten and four units, or otherwise 14, the number thirty-six by three tens and six units, or otherwise 36, and so on. The system may be illustrated in a fairly simple manner by the case of a man who is taking in numbers of a publication, which are packed as he receives them in a certain shelf of his book-case. As soon as he has taken in ten numbers, he has them bound into one volume and placed on a higher shelf. When he has accumulated ten of these larger volumes, he has these, too, bound into a still larger volume, and placed on a third shelf, and so on. Each of the volumes on this third shelf, therefore, contains one hundred single numbers of his publication, and a glance at his book-shelves enables him to see at once the complete number of single publications he has received. Thus, four volumes on the third shelf, six on the second, and nine on the lowest, would indicate 409 single numbers of the publication. If, now, the number twelve be taken as the base of our system of enumeration, the number 14 will no longer denote one ten and four units, but one *twelve* and four units, that is, the present number sixteen. The number 36 would denote, not three tens and six units, but three *twelves* and six units, that is, the present number forty-two. Without finding further examples of this, it is at once clear that numbers above nine would no longer retain their old significance. We should not only have to learn their new meaning; it would be necessary, too, to forget the old. This is one degree worse than learning a new language. Now, since the number 10 would, in the new system, represent twelve, and 11 would represent thirteen, our first duty would be to find two new digits to represent the numbers ten and eleven. In mathematical work these are generally denoted by the letters T and E. Equipped with these two new digits, we can now venture upon a new multiplication table, which may be taken as a specimen of what would have to be learned by those who are enthusiastic enough to take up the study:

$4 \times 1 = 4$	$4 \times 8 = 28$
$4 \times 2 = 8$	$4 \times 9 = 30$
$4 \times 3 = 10$	$4 \times T = 34$
$4 \times 4 = 14$	$4 \times E = 38$
$4 \times 5 = 18$	$4 \times 10 = 40$ (<i>i.e.</i> , our present forty-eight).
$4 \times 6 = 20$	
$4 \times 7 = 24$	

The prospect of having to learn new multiplication tables, and to become familiar with the new significance of numbers, is assuredly not an alluring one. Put briefly, that is exactly what we should have to do if the Duodecimal System were adopted; and it is certainly a little curious that those who object to the Metric System on the score of the inconvenience it would cause should recommend for our adoption a system which the people of this country could never learn. We should still, it is true, have seven days in the week, and but few would reconcile themselves to the idea that there are only ten months and 265 days in the year. On the other hand, the number thirteen would lose much of its fatal significance in the harmless guise of 11. Numbers that have hitherto been invariably connected with certain events would have to be ruthlessly torn from their environment. Would it be easy to realise that the number of Apostles was 10, or should we recognise the 119th Psalm in its new guise of the 9Eth?

So, too, in the question of time. We should have to be satisfied with 50 seconds to the minute, 50 minutes to the hour, and 20 hours would form a complete day; while the present 12.15 train from Euston would start, if punctual, at 10.13. Once more it may be asked: Are we prepared for such a change? We may wish that our primitive forefathers had adopted the number twelve as their base of notation; we may look with longing eyes at a system that is certainly superior to our own; but it is not for us, nor yet for our children. The Decimal System is ours, and we belong to the Decimal System; it is part of our life. It is not too much, however, to hope that our people may have the enterprise to adapt our system of weights and measures to the decimal base, so that in weights and measures and in enumeration there may be one language that all can understand.

T. R. P.

The Worship of the Diagram.

I VIEW with amazement the remarks of your correspondent, Mr. W. A. Whitton, with regard to the use of the diagram and figure. I am by no means prepared to assert that the figure should be the idol which Mr. Whitton seems to think examiners and examining bodies make it, but, at the same time, it would seem that there can be no question of its necessity.

In the first place, without it, how can a teacher of geometry possibly discover whether the apparent "exercise in logical reasoning" shown to him by a boy is after all nothing more than a feat of memory? It is, I think, the experience of every schoolmaster that there are many boys who would rather commit a geometrical proposition to memory than attempt to appreciate its logic; and surely in the teaching of geometry this is the very thing the teacher has to fight against with all his power. Besides this, presupposing that a figure is an aid to imagination and nothing more, is that any reason why it should not be used? It seems to me that Mr. Whitton's contempt for the figure is in direct contravention of the fundamental principle of modern education—the cultivation of intellect by means of the development of the power of observation and of detection of natural cause and effect. I should therefore be driven actually to the other extreme, and say that I should prefer a boy to draw me a figure which he built up as he proceeded with an oral demonstration; and I am bound to say that I have found this method to succeed best in practice.

With regard to the diagram in chemistry and physics, one does not usually expect a diagram either in per-

spective or of such painful accuracy that it represents faithfully the actual relative series of, say, a beaker and a flask. One has a right to expect a *plane* diagram which clearly sets forth the practical method of demonstrating a theoretical truth (such, for instance, as the diagrams in the *Philosophical Magazine*); and, besides this, the habit of care and accuracy engendered by the drawing of a careful diagram is invaluable in its effect on the practical work in the laboratory. I have seen too much of the good effects produced by quick and careful drawing of apparatus ever to abandon my custom of insisting upon it wherever practicable.

Again, it is certainly easy for an examiner to see from the work before him whether a boy has the gift of drawing or not, and it should not be difficult for him to mark accordingly.

After all, the whole question is governed by our ideas of method in education. Just as we tabulate sets of statements or similar reactions in chemistry, use curves and squared paper to represent a law in physics, maps, experiments and diagrams in geography, so must we use figures and diagrams in mathematics, taking care that all our work shall run on the same lines and be co-ordinated to the greatest possible extent.

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Lancing College, Sussex.

"Bradshaw" as a Class Text-book.

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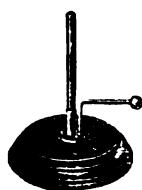
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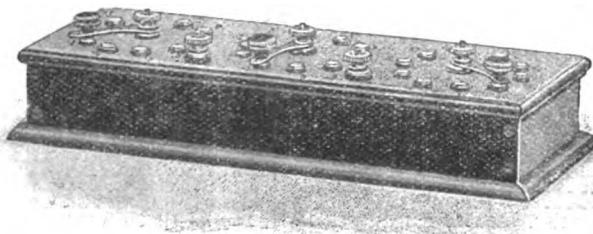
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SIXPENCE.

THE NEGLECTED ART OF PLAIN READING.

By Prof. HENRY E. ARMSTRONG, Ph.D., LL.D., F.R.S.

The hungry sheep look up and are not fed.

In reading Mr. James Oliphant's recent article,¹ I bethink me of a schoolmaster friend of mine, who is particularly successful in imbuing his boys with the confidence to give utterance to what little they know of French and German, so making them the effective possessors and users of that little; his attitude to his class, I am told, is expressed in the phrase he not unfrequently uses—"Hang the grammar, boys: let us have some words!"

Mr. Oliphant tells us that "If the youthful student is not attracted at the outset, there is great risk that all his later work in literature will have too much of the character of drudgery to fulfil its purposes and that the habit of reading will never be firmly established." Precisely so! Having made this admission, he at once proceeds, however, to recommend a course of reading which undoubtedly would savour of drudgery in the eyes of every healthy boy; girls—dear, obedient creatures—would perhaps take what was put upon them without demur but even they would feel that an afternoon at the theatre, spent in the company of Mr. Benson or of Mr. Forbes Robertson, was of far more value than the dreary repetition during a whole term, by a semi- or demi-semi-competent teacher, of somebody's pedantic if not sacrilegious annotations on one of Shakespeare's plays. We flatter ourselves that the schools are making Shakespeare known: we forget that Sir Henry Irving and other powerful actors have worked upon our generation and overlook their supreme services as teachers. It is only of late years that the clerical tie has dared venture into the theatre; we have to thank Mr. Benson, I believe, for the introduction of the fashion of sending whole classes from school to the theatre.

Do let us recognise facts: the vast majority of teachers cannot expound the beauties of our

classics with advantage; the stream of English literature should be allowed to flow pure and undefiled through the youthful mind.

Moreover, let us set plain bread and meat before *pâté de foie gras* and teach simple composition, with reference to everyday work, before attempting to develop a refined taste and a sense of perfection in composition "by dwelling on the beauty of Tennyson's versification." It were not unfair comment on this advice to quote lines taken from Henry Sidgwick's Memoir:

Whereof the priests, for all they say and sing,
Know none the more nor help in anything.

The average teacher simply cannot understand, say, "In Memoriam." In Canto 123, for example, almost the whole philosophy of modern geology is compressed into eight lines:

There rolls the deep where grew the tree.
O earth, what changes hast thou seen!
There where the long street roars, hath been
The stillness of the central sea.

The hills are shadows and they flow
From form to form and nothing stands;
They melt like mist, the solid lands,
Like clouds they shape themselves and go.

How can such versification be appreciated by those who scarcely know the distinction between sand and gravel, who not improbably are entirely ignorant of the nature of clay and limestone and incapable of differentiating a fossil from a fig-leaf? Let us acknowledge that our "appreciation" of not a few "classics" is based, in no small measure, on the operations of a class of literary log-rollers whose business it is to write up systematically the merits of mere word-painting: let us learn to think more of the stuff in it—of the subject-matter of the literature we prescribe for the use of schools. Far better give Charles Kingsley's "Town Geology" as a means of creating imaginative interest in legends of the past than Morris's languorous "Earthly Paradise": it might be generally recognised that we live in an earthly paradise if our schoolmasters would but let the fact be known.

Ruskin, without scientific training, could picture in vivid language (and did so with perfect

¹ "The Best Authors for School Reading," THE SCHOOL WORLD, December, 1906.

justice and truth) the gradual conversion of the black slime of a beaten footpath into sapphire and opal and diamond—the most perfect and beautiful of gems. An equally striking flight of fancy on his part is to be found in the chapter on Pyramid Builders in the "Ethics of the Dust," where he portrays the process by which atoms assort themselves to form crystals. But Ruskin was a true artist—a man tutored and inspired by the contemplation of Nature, not by books alone; he could therefore be constructive.

Take all the fairy tales together, all the heathen myths, it is impossible to match the wonders unseen around us by ordinary eyes—yet open to inspection by all who are trained, in some degree, to adjust their visual powers to such sight and have learnt to decipher a few of the letters in the great book of Nature.

Go to! Mr. Oliphant: preach a saner doctrine and make it clear to teachers of our literature that books alone are of small value: that there must be real understanding of things—not mere lip service to words; teach that meat should be sought for.

The January SCHOOL WORLD contains an article on "Paraphrasing in Practice." If the object be to cultivate a refined taste, an appreciation of versification, how can we ask young people to reproduce in their own words passages such as are quoted on p. 12 in that article? Such tactics simply nauseate. Fancy requiring a boy to translate the "Village Blacksmith" into his own words—his proper tendency would be to use language of the "jolly rot" type! The only phrase in the verse quoted likely to give difficulty or require explanation is "like the tan," which nearly every teacher would make little of: though, if hunted down, it might afford real sport and carry a class from the Blacksmith to the contemplation of their boots and thence perhaps to the New Forest, a far more delectable spot than any Morrisian paradise. It is because English is "taught" on such lines that boys come to our colleges unable to write two lines of decent English descriptive of their own work—unable to read the meaning out of a few pages of straightforward prose, let alone to write a passable précis thereof—unable and unwilling to read books of worth.

Of what consequence is it whether "Treasure Island" has or has not "that elevation in subject or tone that could alone make it educative in the highest sense": let us take it in the best sense we can—as one of the most stirring and lifelike books ever written for boys, young or old. Does not Prof. Sadler recommend the study of the humanities? "Treasure Island" is just full of human nature. It is sheer pedantry to pretend that elevation in subject or tone alone makes for education: and surely Stevenson took care to write English.

Paraphrasing my schoolmaster friend's injunction, I would say to boys and girls—"Hang classic literature! browse on books, early and

late; almost any books, all the books that you can get hold of: read them and get the best out of them that can be got." So handled, they will gradually learn to regard books as veritable "kings' treasures," full of interest and information: for if it be in them, in time they will learn to separate wheat from chaff, to gather a grain here and a grain there—in itself a faculty to be cultivated.¹

I am Goth enough to urge that, at first, it matters little what is read, so long as the habit of reading seriously and acquisitively be gained—it matters little, that is to say, so long as real books are read. The practice prevailing in elementary schools, fathered during years past by School Boards everywhere, of using "Readers," is one of those wicked perversions of sane method which should be terminated without further loss of time.

Supposing that we were to consult boys and girls themselves instead of following the presumably childless, grown-up framers of narrow, official schemes of literature, who have clearly no longer any recollection of the days of their youth and of the vast longing for knowledge and incident by which they were possessed while "uneducated": should we not be put in possession of really valuable advice? Would they not tell us that Macaulay's essays on bores like Warren Hastings and Frederick the Great had little interest for them—being for the most part beyond their comprehension; that much of Scott was too prosy to follow and that they protested against a year or two of it in school when they could read it all in the summer holidays? Not the "cultivation of the historic sense"—pace Mr. Oliphant—but the innate desire for "a closer knowledge of actual fact," they would probably say, made them wish for food unpeptonised, with which their young stomachs could deal; for plenty of it too. Boys like cake with plums in it, together with unlimited bread and butter; as a rule, they don't like the fat of meat—and simply won't eat it: the taste comes later in life, when the tendency to elaborate adipose tissue, will you nill you, more or less influences appetite.

There are old boys who can help us to understand young boys—Hugh Miller, for example, whose account of his education in "My Schools and Schoolmasters" should be in the hands of every teacher and of as many boys as possible. After learning his letters by the study of sign-posts, he attended a dame school in his sixth year; the process of acquiring knowledge had been a dark one, he tells us, until his mind awoke to the meaning of the most wonderful of all stories—the story of Joseph. "Was there ever

¹ I well recollect reading Marryat's "Snarleyowes" when a very young lad and being much impressed by the opening of the King's Despatches by blowing down on the sealing wax through a red-hot tobacco-pipe stem. When I became a student of chemistry and had to wax over corks carefully, the ingenious expedient described by Marryat at once occurred to me: over and over again it has proved to be of service. Whether "Snarleyowes" was educative in the highest sense or not, I learnt a trick of great value from it. Classical writers, being simple literary folk, as a rule, are terribly barren of suggestion.

such a discovery made before? I actually found out for myself that the art of reading is the art of finding stories out of books and from that moment the art of reading became one of the most delightful of my amusements." After school he read the new-found story of Joseph himself—not once but many times; then came the other Bible stories, followed by Jack the Giant Killer and many more of resembling character. What follows is worth noting:

Those intolerable nuisances the useful-knowledge books had not yet arisen, like tenebrious stars, on the educational horizon, to darken the world and shed their blighting influence on the opening intellect of the "youth-hood"; and so, from my rudimental books—books that made themselves truly such by their thorough assimilation with the rudimental mind—I passed on, without being conscious of break or line of division, to books on which the learned are content to write commentaries and dissertations but which I found to be quite as nice children's books as any of the others. Old Homer wrote admirably for little folk, especially in the *Odyssey*; a copy of which—in the only true translation extant, for, judging from its surpassing interest and the wrath of critics, such I hold that of Pope to be—I found in the house of a neighbour. Next came the *Iliad*; not, however, in a complete copy but represented by four of the six volumes of Bernard Lintot. With what power and at how early an age true genius impresses!

In time, every available book was devoured by the lad. Apparently he learnt little in school, where his behaviour was far from correct: but out of doors—the seashore and the rocks were his books:

And Nature, the old Nurse, took
 The child upon her knee,
Saying, "Here is a story book
 Thy father hath written for thee.

"Come wander with me," she said,
 "Into regions yet untrod
And read what is still unread
 In the manuscripts of God."

He read to some purpose indeed. In later years, as a mason, he studied the rocks as he chiselled them; and though eventually he blossomed out as a successful newspaper editor, he became famous as a geologist on account of the wonderful work he did in unravelling the mysteries of the Old Red Sandstone. Mr. Oliphant might well include his countryman's book on this subject in his list of classics, as it is now printed in the "Everyman" series.

The people who read seriously at the present day are scarcely those who have been nauseated at school by a diet of hashed English classics, fed in at a snail's pace rate multiplied to the minus tenth; theatres and music halls seem to be the main attraction to those who have seen life and soul taken out of books at school.

Far be it from me to discourage either the study of words or the reading of classic literature—I would impress from the beginning, constantly, upon every boy and girl—what never is impressed—earnestly and authoritatively, as Ruskin says in his "*Sesame and Lilies*," know-

ing that he is right—"that you must get into the habit of looking intensely at words and assuring yourself of their meaning, syllable by syllable—nay, letter by letter." Further, that "no book is worth anything which is not worth *much*; nor is it serviceable until it has been read and re-read and loved and loved again; and marked so that you can refer to the passages you want in it. . . . Bread of flour is good; but there is bread sweet as honey, if we would eat it, in a good book."

I would go still another step and urge that what is read should be criticised—that the authority should always be asked for, questioned and considered upon which the statements are made. The belief that what is printed is true would then give place to a proper scepticism; text-books on "science" would no longer all be regarded as scientific treatises; and style would come to be of importance—there might even be general agreement with an opinion such as Warde Fowler expresses in his "*Oxford Correspondence of 1903*" :

I wish they would attend a little more to style—to the *ars rhetorica*, which is after all in its proper sense only the result of a conscientious effort to think clearly and get down your meaning neatly. Rhetoric need not mean adornment, though it is often used in that sense. No one would call Darwin a rhetorician, yet he was one in so far as he positively refused to let any sentence stand of which the meaning was not clear in his mind and pellucid to the reader.

If we are not very careful, now that we are becoming more or less alive to the need of paying some attention to our own language, by aiming too high we shall make precisely the same mistakes that we have been making all these years in teaching Latin and Greek. In this connection, apart from much elegant trifling, an unfortunate lack of considered literary polish and horrible superabundance of comma'd conjunctions, the "*Upton Letters*," here and there, contain not a few grains of superlative wisdom of which teachers may well avail themselves—as they are clearly the outcome of solid experience and the outpourings of an acute and not unduly biased though dulcet mind. The letter of July 16th, 1904, is of particular value—a scathing condemnation of the existing system but full of suggestion; near its close, we read: "What produces the cynicism about work so common in classical schools is that the work is of a kind which does not seem to lead anywhere and classics are a painful necessity which the boys intend to banish from their mind as soon as they possibly can."

English classics are all too rapidly taking up the position which is being vacated by Latin and Greek.

I will not quote more from the letter—striving teachers should read its every word and seek to give effect to its lessons. In passing, let me add, we must lament the fact that its writer lacked the courage, when the opportunity was his, to join battle with the foes whose existence he re-

cognises and deplores: his worst should have been of more worth than the best of those he condemns, because he recognises what is bad: in a course which so few follow. If, as asserted at the close of the letter—"it is the stupidity of virtuous men which is responsible for the continuance of [our] arid, out-of-joint system"—the sooner "virtuous men" leave the schools, the better it will be for the public weal. Virtue like literary training is of small value unless it find active courageous expression: inoperative virtue is little short of vice.

To reform the teaching of English—or rather, I should say, to give teaching in English—we need to begin low down by training children to read aloud properly. Eminently sane advice is given on this subject by Mr. Charles Simmons in an entirely admirable and luminous article on "The Preparatory Day School of the Future" published in the September number of the *Contemporary Review*. Mr. Simmons dwells on the evils arising from inarticulateness of speech combined with want of ear training; he asserts that in failing to give training in articulation we are throwing away the most important of all aids to learning. Thring, as he points out, long ago insisted on the talismanic power of such teaching. Mistakes in spelling are mainly reproductions of mistakes made in pronunciation; words are never truly seen until they are pronounced properly.

We neglect such training absolutely—and with what consequences? Not only spelling suffers. Nothing is more striking than the self-conscious, inarticulate, mousey-quiet and subdued state of the average English boy or girl in class—not only will they not ask questions but it is almost impossible to drag more than monosyllabic answers from them. The contrast which the American schools offer in this respect is extraordinary: all the Moseley Commissioners were struck by the open and free manner in which exchange of opinion took place between teacher and pupil. Why are we so stupid—is official method in any way responsible for our madness? When I complained recently in a school that the boys spoke only in whispers and suggested that they should be made to speak out, I was told—"Oh! the inspector likes them to speak softly!" The temptation was irresistible: the only possible reply to such a statement was to imprecate that inspector.

To gain time for reading, I would eschew at first all formal lessons on geography, history and much else—everything indeed except manual work—and devote hours, many hours, per week to the mere reading aloud of interesting books and to talk thereon. Only when all were proficient readers should the reading be done silently, for the most part—there should always be much reading, be it noted—yet never entirely. Evening literary work at home or at school should be confined to reading. The now conventional lesson must have been the discovery of some exceptionally clever boys in the past, as it is a most effective way—now that the cane is abandoned

—of getting the work done mainly by the teacher. Learning by serious reading will relieve the teacher and throw the onus back on the pupil—something will be learnt when reading is practised systematically.

In reading, every kind of book should be laid under contribution. And reading in foreign languages too should be encouraged, as the one fruitful means of acquiring confidence and a vocabulary. We must advance beyond the miserably narrow "classic" course now prescribed by authority and more and more followed in the schools: this, that and the other subject will be read up in turn; informing books of every kind will be sought out and laid under contribution.

The result of such search, unfortunately, will be the discovery that the number of readable books giving sound and accurate information is very small. But this may not be altogether a misfortune.

By rendering breadth and clearness of understanding impossible, by discouraging the growth of thought-power, text-books and primers are now defiling the ways of education and hindering it almost as seriously as do examinations; both tend to favour mere acquisitiveness. But they pay! If you make the suggestion to a publisher that readable informing books are required, you are quietly told that it will not pay to produce them; as a writer you know that you cannot earn a living wage by writing them—yet written they should be.

Books we must have and the art of using them must be universally taught—for is it not written:

It is clear . . . that with this simple circumstance, facility of getting Books, the whole conditions of the business [of universities] from top to bottom were changed. Once invent Printing, you metamorphosed all Universities or superseded them! The Teacher needed not now to gather men personally around him, that he might speak to them what he knew: print it in a Book and all learners far and wide, for a trifle, had it each at his own fireside, much more effectually to learn it!—Doubtless there is still peculiar virtue in speech; even writers of Books may still, in some circumstances, find it convenient to speak also—witness our present meeting here! There is, one would say, and must ever remain while man has a tongue, a distinct province for Speech as well as for Writing and Printing. In regard to all things this must remain; to Universities among others. But the limits of the two have nowhere yet been pointed out, ascertained; much less put in practice: the University which would completely take in that great fact of the existence of Printed Books and stand on a clear footing for the Nineteenth Century as the Paris one did for the Thirteenth has not yet come into existence. If we think of it, all that a University or final highest school can do for us is still but what the first school began doing—teach us to *read*. We learn to *read*, in various languages, in various sciences; we learn the alphabet and letters of all manner of books. But the place where we are to get knowledge, even theoretical knowledge, is the Books themselves! It depends on what we read, after all manner of professors have done their best for us. The true University of these days is a Collection of Books.

I know of no passage in the whole of Carlyle's

writings, indeed in any book, more pregnant of meaning : none, however, which is more neglected of universities and schools generally ; and yet we are governed in all things by literary minds. Could proof more absolute be given of the inability of physicians to heal themselves ? of the need of an effective correlation of practical with literary studies ? Well may Ruskin say—" What a boundless capacity for sleep and for serene stupidity there is in the human mind. The fact is we are all and always asleep throughout our lives ; and it is only by pinching ourselves very hard that we ever come to see or understand anything." We may surely give heed to the words of one whose writings certainly are educative in the highest sense : and waking up from our Fat-Boy-in-Pickwick state not trouble, for the present, who are the best authors for school reading—but see to it simply that we have much *Plain Reading* in school. We may well be content to rank such instruction with that in the equally neglected arts of *Plain Cooking* and *Plain Sewing*—bearing in mind that the three arts are those which primarily determine the happiness of civilised man.

THE METRIC SYSTEM.

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I.—EXPOSITION AND ILLUSTRATION.

IS the metric system badly taught in our schools ? The report of the examiners on the Oxford Local examinations of July last would seem to justify an affirmative reply. Their criticisms are to the following effect :

- (1) "There was no proof that the metric system had received the attention it deserves."
- (2) "The terminology of the metric system is not properly understood."
- (3) "Carelessness as to the position of the decimal point is very common in all questions involving decimals."
- (4) "The meaning and object of approximation were not generally appreciated."
- (5) "Weights and measures in the metric system proved stumbling-blocks to many."
- (6) "Change from the metric to the British system and vice versa caused great confusion."

If the schools have to plead guilty to this formidable indictment, we must at the outset distinguish between "bad teaching" and "insufficient drill." By "teaching" we understand an endeavour to draw out the intelligence of the pupils, combined with clear explanation and apt illustration. By "drill" we mean the continued repetition of the same type of example, combined with strict insistence upon method and neatness.

It is quite possible for disaster in examination to follow the best teaching, if insufficient time has been given to drill. Formerly, when a boy's brain was regarded as a cabinet of empty pigeon-holes to be crammed with knowledge, purely mechanical drill produced machines, often excel-

lent in their way, but devoid of initiative. In an examination such machines would answer a question either accurately or not at all, and the products of such drill were probably regarded as examples of good teaching. Now, however, that we believe the brain to be an organism which should be developed by judicious culture, we are liable to neglect the drill altogether, because so much more time is required for heuristic than for didactic teaching. But the examination results are at times mistakenly diagnosed as due to bad teaching. It should also be noted that, although the clearest teaching and the best drill may have been given by each individual master, yet the resultant effect upon a pupil's mind may be unsatisfactory if successive masters have adopted very diverse methods. There must be a certain modicum of agreement and continuity of purpose.

We have first to consider the terminology of the metric system. This seems so beautifully simple to an adult that its difficulty to the childish mind is apt to be underrated. Just because there is so little to explain, there is little for the mind to grip. Consequently, boys who appear to know the exact meanings of *metre*, *centimetre*, and *millimetre* one term will return after the holidays with minds almost as blank as if they had never seen a metre-rule in their lives. This forgetfulness may be due in the first place to want of vivid illustrations. A master is apt to imagine, when a class can measure the length of a room in metres, of a desk in centimetres, and of a model in millimetres, that each boy knows the meaning of these words. But much more in the way of illustration is needed.

For instance, the following questions might be set :

State roughly in metres the height of a man, of a lamp-post, of a room ; the breadth of a road or building ; the length of a cricket pitch or field ; the distance between two milestones ; the heights of mountains and breadths of rivers :—

thus leading up to kilometres. Again—

State roughly in centimetres the breadth of your hand ; the lengths of your fingers, foot, fore-arm ; the diameters of various coins, and the thicknesses of certain books. Also estimate in millimetres the breadth of a finger, pen, or pencil ; the thickness of a coin, wire, thread, or sheet of paper :—

thus introducing decimals of a millimetre.

Only when such questions are readily and intelligently answered do the pupils begin to understand the terminology. If any master has never tried the effect of these queries, he must not be surprised if various boys should declare that the height of a man is 1 metre, 3·6 metres, or 6 metres ; nor if the length of a cricket pitch should be estimated at 2·22 metres and yet 22·2 centimetres at the same time by the same individual ! These are *actual*, not *imaginary*, replies from boys who had made scores, if not hundreds, of measurements with a metric rule !

Perhaps the *decimetre* should be now introduced. Opinions upon this point vary. Some

masters object to this word on the ground that it confuses pupils and is not used by practical engineers. On the other hand, a successful master declares that his best results have been obtained by basing his whole system upon the *decimetre*, which he introduces by the name of "hand," pointing out that the height of a horse is expressed by almost the same number in *decimetres* as in *hands*. However this may be, the system is certainly more symmetrical if the term *decimetre* be retained, and its use probably leads to a clearer idea of the litre. The other terms of the metric system should be illustrated in a similar manner when the stage for their introduction is reached.

Pictures will be found of very little use. This is so generally recognised that there appear to be few metric charts on the market. There is the well-known one of the Decimal Association (Oxford Ct., Cannon St., E.C.); another by Barnard Smith (Macmillan); another by Messrs. G. Philip and Son (Fleet St.); and one or more by Messrs. Hachette et Cie. (Charing Cross). Whilst some of these are excellent, in certain cases the diagrams are drawn to a reduced scale which completely destroys their practical value.

There can be little doubt that actual measurement made by the boys themselves in class is the only trustworthy method of bringing home to their minds the nature of the subject they are studying. Hence at the earliest stage of the work no apparatus is required beyond a metric rule for each boy and a set of models of various sizes and shapes. Cubes, prisms, pyramids, cylinders, and cones can be obtained in abundance. No special reference to these seems required, except, perhaps, that each can now be bought in two different sizes for the use of alternate boys in class, in order to prevent copying.

But for the master's use the Metric Demonstration Rule (to be obtained from the Educational Supply Association for 2s.) seems worthy of special mention. It is so clearly marked that it can easily be read from the opposite end of a class-room. The metric rules for the pupils are made in great variety. There should be a few metre-sticks, which will enable two boys to measure the length of a room or field by placing their sticks end to end alternately. Then each boy should have a half-metre rule for general practical work, and also a small ruler for constant use. Incidentally it may be remarked that the best form of ruler has one edge marked with centimetres and millimetres, another with inches divided into tenths, and on the reverse side inches divided into twelfths and sixteenths respectively.

Plenty of drill must be given in converting measurements from centimetres to millimetres, metres to kilometres, &c. We are thus led to consider the position of the decimal point, with special reference to the comments of the Oxford examiners. Probably the chief cause of failure is want of appreciation of "local value." It is not sufficient that a pupil on seeing the number

234·5 should be able to say that the "3" represents thirty, or that the "5" represents five-tenths. He may repeat such lessons without mistake, and yet when asked to multiply the number by ten he will write down 234·50. Here we do seem to trace the error to bad teaching. It appears that he has been allowed to say: "To multiply by ten you add a nought." He should rather have discovered that in multiplying by ten each figure is moved one "place" to the left. But however well he may have been "taught," if he has not also been "drilled" he will almost certainly discover the fallacious "rule" for himself; and the sharper the boy the greater the danger. The only remedy is to insist (until a fairly advanced stage is reached) that he must actually move the figures in performing the operations of multiplying or dividing by powers of ten. Thus:

"What is the weight of 100 packets, each weighing 23.4 kilograms?"

$$\text{Total number of kilograms} = 23.4 \times 100 \\ = 2340.$$

Again :

" If 23.4 dollars are equally divided amongst ten men, how much does each get?"

$$\text{No. of dollars each gets} = 23.4 \div 10 \\ = 2.34$$

In the early stages it may be necessary to make the pupils work upon squared paper, *ruling a line to indicate the unit's place*. Thus:

" How many litres are there in 230 casks each containing 346 litres? "

	Multiplying by 200 , , 30 , , 230
--	---

Answer: Seventy-nine thousand five hundred and eighty litres.

Gradually they should be taught to compare this process with the following abbreviation:

$$\begin{aligned}\text{No. of litres} &= \frac{346 \cdot 230}{1000} \\&= \frac{692}{1038} \\&= 79580\end{aligned}$$

But the *line* should be retained until they have at least been introduced to decimals.

The process may be presented as follows:

"A rod measures 3 metres 45 centimetres; find the length of (a) thirty such rods, (b) a thirtieth of a rod.

$$(a) \text{ Length} = 345 \text{ m.} \times 30 \\ = 345 \text{ m.} \times 3 \\ = 1035 \text{ m.}$$

$$(b) \text{ Length} = 345 \text{ m.} \div 30 \\ = 0345 \text{ m.} \div 3 \\ = 0115 \text{ m.}$$

Gradually the intermediate step would be dropped, and the line replaced by points; thus:

$$(a) \text{Length} = 3\cdot45 \text{ m.} \times 30 \quad (b) \text{Length} = 3\cdot45 \text{ m.} \div 30 \\ = 103\cdot5 \text{ m.} \qquad \qquad \qquad = 0\cdot115 \text{ m.}$$

Masters wedded to older methods will contest the wisdom of such proposals. But the whole object of this method is to make the pupil feel the flow of the figures from left to right or right to left past the unit's place. If some such system were universally adopted it would hardly be possible to hear (as we so often do now) of boys dividing by 100 by long division or multiplying each figure separately when multiplying by ten. The opinion of many mathematical masters is that nothing less than rigid insistence upon such drill for some time will give children a real grip of the decimal notation.

Of course, it is here assumed that the whole of the above work would be illustrated by means of the metre scale, and that plenty of concrete examples would be given in the "four rules" dealing with francs and centimes, dollars and cents, or pounds and florins, and also with the gram and the litre.

Boxes can be obtained (from the E.S.A. at 4d. each) containing imitation German money. Counters representing English money can also be bought, but not in pounds, florins, and mils (which will probably be the form our coinage will take if decimalised). It was stated that strict laws forbid the imitation of either French or American money; but fortunately sets of imitation French coinage can be obtained from Messrs. Hachette et Cie.; and there is no reason why the boys themselves should not make counters out of paper or cardboard to represent any system. Would it not also be a valuable exercise—in connection with approximation—to teach children how to change £ s. d. into pounds, florins, and mils? This is a mere suggestion, but it might be worth a trial.

Weights are, of course, to be found in every laboratory. These provide a valuable change, and appeal to another faculty. The great test, however, of the metric system lies in its application to area and volume. Having learned the meaning of a square, the pupil will discover for himself that a square centimetre contains a hundred square millimetres. This may be done either with or without squared paper. A blackboard of one square metre divided into ten thousand square centimetres is not only useful to the master, but will convey more to the pupil than any amount of merely verbal statements. Here the teaching must again be followed by careful drill in reducing sq. m. to sq. cm., &c.

This will be a convenient place to introduce the idea of approximate multiplication, the pupil at first merely leaving out the superfluous figures in the addition of the columns, and then learning to perform the whole operation to (say) four-figure accuracy. It may be well (at any rate initially) to avoid the phrase "to so many decimal places," as when this is learned first the true idea of ap-

proximation seems afterwards to be grasped with difficulty. It is a common mistake (perhaps not confined to pupils) to suppose that if a measurement is known to two decimal places its square can be calculated to one decimal place. It should be pointed out that if we know that the length of the side of a square lies between 0·03 and 0·04, we only know that its area lies between 0·0009 and 0·0016; whereas if the length lies between 2·03 and 2·04 we find the limits for the area between about 4·12 and 4·16. Similarly, show that there is no necessary connection between the number of decimal places to which certain quantities are known and the number of decimal places to which their products can be calculated.

Again, let the pupils calculate the area of a square of length 123·4 cm., and then find what difference it would make if the first measurement had been 0·05 cm. too short. They will be surprised to find that, so far from the difference being merely 0·05 sq. cm., or even 0·5 sq. cm., it is actually greater than 10 sq. cm.; but, on the other hand, the fourth significant figure is scarcely altered, and the third not at all.

If it takes too long for the pupils to discover, it might now perhaps do no harm to state that if the side of a square be known to *four-figure* accuracy, we can calculate its area to at least *three-figure* accuracy; and, further, that if any two numbers be known to an accuracy of a given order, we can determine either their product or their quotient to an order which (at the lowest) is less than the given order by unity.

In the report upon the Oxford (Senior) Local examinations it is stated that "the larger number of candidates used contracted methods in a thoughtless way, either rejecting too many figures and so obtaining inaccurate results, or going to the other extreme." Such thoughtlessness would be less common if every type of question in which approximation is possible were illustrated by at least one example in which the answer had to be calculated to four significant figures.

A typical example would be: "Find to four-figure accuracy the circumference of a circle of radius 95·6784 metres having given $\pi=3\cdot1415926$. How many figures of each number will you need for your calculation?"

One would not expect boys to enter into refinements of accuracy or to note that the figures 95·68 \times 3·1416 would be sufficient; one would merely require them to say: "To ensure *four-figure* accuracy retain the first *five* figures of each number thus: 95·678 \times 3·1416."

But to do justice to the question of approximation would occupy the whole space at my disposal. It cannot, however, be left out of consideration in dealing with the metric system, so that these brief remarks are perhaps not altogether misplaced; for, although they may appear trite to many minds, there are some to whom these suggestions may be not quite valueless.

Volumetric measurements can be treated from two totally different points of view. We may take the *litre* as our unit of measurement, in-

which case the treatment will be precisely the same as in dealing with linear measurements. Excellent models of the metric liquid and dry measures can be obtained from the E.S.A. However, it must be confessed that although admirable for the purpose of illustration, they are scarcely suitable for practical work, either in the laboratory or in the class-room. It would really seem that in this particular case inexpensive full-size pictures would convey almost as good an idea as the models themselves. The teacher, however, can again appeal to everyday experience by asking such questions as—

"State in litres the volume of a tea-cup, bucket, bath, pond, room, haystack, or church."

The consideration of the litre as a cubic decimetre is, of course, of far greater difficulty and importance. This can be adequately illustrated only by the beautiful little model sold by the E.S.A. (price 6s.). It consists of a cubic decimetre divided into ten slabs of a hundred c.c. each. One of these slabs is again divided into ten bars of ten c.c. each, and one of these into centimetre cubes. No school should be without this model, which will suggest to the experienced teacher numerous exercises in calculation and in approximation, besides affording the best means of bringing home to the average boy the true nature of space.

It seems unnecessary to dilate further upon the illustrations and drill which will be required to consolidate the instruction given concerning volume and weight, as the teacher who has grasped the principles already enunciated will have no difficulty in providing similar object-lessons and exercises. But he must be warned against allowing any boy to confuse weight with volume. The Oxford Local report on science states that "in the numerical questions many candidates treated kilograms as a measure of volume," and recommends that "more time be given to the study of units."

The ideas put forward in this article may be summarised as follows:

(1) Bad examination results do not necessarily imply bad teaching. The results may be caused either by insufficient drill or by too great diversity of methods.

(2) The terminology of the metric system should be copiously illustrated both orally and practically by numerous examples.

(3) The position of the decimal point (or, better still, that of the unit's place) should be emphasised and treated as fixed; whilst the figures should be regarded as flowing to the left or to the right in multiplication or division by powers of ten.

(4) Attention should be devoted to methods of approximation throughout the school course.

(5) Most of the models described above will be found useful if not indispensable.

So far no mention has been made of methods of changing from British units to the metric system. The consideration of this important subject must be reserved for another article.

THE PRONUNCIATION OF LATIN.

By J. L. PATON, M.A.

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THE battle of the pronunciations is lost and won. The Classical Association has proposed, the headmasters have disposed, both the Upper House of the Conference and the Lower House of the Association have approved the new system by decisive majorities, and, so far as the schools are concerned, the question ought to be settled.

This is the right procedure. As Bacon says, if you look for despatch, the preparation should be the work of few, the experts; the debate and examination should be the work of many. If it had done nothing else, this piece of work alone would have justified the existence of the newly fledged Classical Association, and it has done wisely to begin with fundamentals.

It was natural that so far-reaching a reform should not be put through without opposition. One cannot drain a marsh without incommoding the resident frogs. Indeed, in this nicely balanced world there can be no advance without loss, no plus without a minus, no gain without paying the price for it.

What is the case for the opposition? It has able spokesmen, and the case did not suffer through feeble presentation.

There is first of all Bishop Welldon. Latin is already sufficiently hard, he argues. Why add to the hardness of it by introducing artificial difficulties; why not let the boy pronounce Latin in the natural way as he does his mother tongue? The answer to this is: First, that the boy has many natural ways of pronouncing his mother tongue; there is no fixed rule or principle about the pronunciation of English, and one of our chief objects in teaching a boy Latin is to give him ideas of system and law, to make him apply principles; in English, spelling, pronunciation, everything is empiric and capricious; in Latin, pronunciation is according to spelling and spelling according to pronunciation; each vowel, diphthong, or consonant has a certain value; given certain letters one knows how they must be pronounced. Secondly, as to the introducing of artificial difficulties, this argument carries us a little too far. Why not apply it also to the learning of French? Bishop Welldon, in his speech, scouts the notion of a boy ever being able to learn at school how to pronounce French properly, and cites from Dr. Arnold in evidence a passage which was perhaps true for Dr. Arnold's own day. Why then attempt the impossible? Why introduce artificial difficulties? If we are to be consistent we must teach "jee suiz, tu ees, ile est."

Dr. Gow's interesting speech at the Conference dealt with the historic side of the question. But no one would suggest that boys of the twentieth century should be taught the English pronunciation to prevent them from understanding the service of mass. The Westminster play is a question for Westminster School, past and present; to sug-

gest that it would take "Old Westminsters" thirty years to accustom themselves to the new method is to make a serious reflection upon the adaptability (if one may use a Darwinian word) produced by a Westminster education. Probably their loyalty would be equal to the strain, if their adaptability is not.

More worthy of serious consideration is the speech of the chairman of the Incorporated Association of Headmasters, Dr. Rendall, of Charterhouse. His argument was that the adoption of what he somewhat paradoxically termed "the new pronunciation" would create a breach between Latin and English; if the old pronunciation is retained a boy recognises more readily the Latin derivatives in his own language, such words as "civilisation, vicarious, ingratitudo," and consequently the study of Latin reacted more vitally and fruitfully upon his understanding and use of his mother tongue. Dr. Rendall's plea was that, as there were two systems of pronunciation existent among us, we should recognise the existence of both, but their respective spheres should be strictly delimited, the "old" pronunciation being used in the schools where the chief consideration is English, the "new" pronunciation in the universities, where regard should be paid to the claims of scientific philology.

Dr. Rendall also pointed out that each Continental nation had adapted Latin pronunciation to its own phonetic values; we did not attempt to read Chaucer according to the English pronunciation of Chaucer's time, we read it according to our own pronunciation, so that it might be more real to us. Why should we not apply the same principle to Virgil, Horace, Cicero?

This is a point of view which cannot be lightly set aside. But the advocates of the "new" pronunciation are ready to take up the challenge on this ground too. Confining the argument strictly to the relations between Latin and the mother tongue, there are three arguments for the "new" system.

First, there is already a breach between Latin and English which no system can bridge. The English derivatives do not correspond in quantity to their Latin originals. To take the words mentioned above, we say *civilisation*, Latin says *civilis*; we say *ingratitude*, Latin says *ingratus*; we say *latitude*, Latin *latus*; other words at once suggest themselves, such as *régent*, *māternal*, *derivative*, *experience*, *examination*, *evidence*, *tribulation*. It is impossible, therefore, to have an accurate correlation between English and Latin if we are to retain any pretence of scholarship whatever.

Secondly, it was pointed out at once that, as a matter of fact, most of these English derivatives do not come from Latin direct but through French. The proper scientific correlation will, therefore, be through French. If a boy is to gain any idea of the laws of language development, he must learn Latin as it was spoken, French as it is spoken, English as it is spoken; he has then, at any rate, the material on which to work; he will place in

their right relation *bovem*, *bœuf*, *beef*; *canto*, *chanter*, *chant*, and so forth.

Thirdly comes a point which appeals specially to those who have to deal with the raw material which does not find its way to Charterhouse or Westminster. One of our chief difficulties in dealing with the elementary-school boy is the mispronunciation of the mother tongue. Dialects vary, but the problem remains the same all over the country for those secondary schools which are in touch with the people. The only way to cope with vulgarity of pronunciation is to make a new beginning, to start with a new language in which pronunciation must be a matter of conscious effort, or, in other words, to get back to phonetics. But the phonetics must be concrete, not abstract, and nothing helps us so much here as a language in which each sound is pure and simple, each sound is easy, and each is represented always by a definite symbol. Once a boy accustoms himself to hear correctly and speak correctly in Latin he begins quite insensibly to articulate better in English, to mind his h's, to disaccustom himself to the final r in *idea-r* or *Isaiah-r*, to give to the consonants their proper value, and to the vowels their proper purity. There is an analogy between the process and the way that the Greek script reacts upon the English handwriting. Many teachers have noticed how, directly a boy begins to learn Greek, there is a simultaneous and spontaneous improvement in his English handwriting: in Greek he has to form each letter separately and each letter carefully; the result is that his writing muscles, quite unbeknown to himself, transfer to his English writing what they have grown accustomed to in writing Greek. It is so with careful pronunciation of Latin, and it is so for the same reason. Each syllable has to be separately and carefully articulated in Latin, and the result is that there is less slurring and vulgar slovenliness in English.

But the great argument is uniformity, and the only possible uniformity is through the method prescribed by the scholars of the Classical Association. "Old boys" must shift for themselves: the dead past must bury its dead or else learn anew. Our business is with the present and the future, and to them our first duty is not to inflict upon them that bewildering uncertainty which was inflicted upon us. Many of the present generation have been hustled about from one system to another until it is a wonder that we have any notion of system left in us. We have said lines to one master according to one system, and read Cicero to another master according to another system; have passed from one school to another, or from school to university, and found everything unsettled and chaotic. The time past may suffice for this; we have had over thirty years of it. The intermediate schools of Wales took the matter in hand systematically and settled down to the new method without any difficulty; Scotland has always had it; it is time the predominant partner made up her mind and set her house in order. Let her move altogether if she move at all.

HOW TO READ AN AUTHOR IN CLASS.

By JAMES OLIPHANT, M.A.

THREE is hardly any branch of an English education that may not be associated with the reading lesson, and though the relation of the more formal aspects of linguistic study to purely literary appreciation may seem somewhat arbitrary, there are undeniable advantages in bringing them close together. The practice of isolating the lessons in spelling, writing, grammar, composition, and elocution from each other and from the reading of an author, and even of putting them into the hands of different teachers, is not to be defended. Language, after all, is a unity, and though it may be sometimes convenient to separate theory from practice, or the scientific from the aesthetic side, every effort should be made to maintain the synthesis. The use of specially prepared text-books, where words and phrases are taken out of their context, or piled up with unnatural iteration, to illustrate particular points of linguistic or syntactical theory, is apt to give a distorted view of the art of literary expression, and certainly destroys much of the pleasure which its study should afford. Such manuals, if not reserved for the teacher, should at least be put into the hands only of the more advanced pupils, who have done a good deal of reading. As in the learning of a foreign language actual specimens of its literature should be the basis at every stage, so in the study of the mother tongue the reading of an author should be made to gather up all possible lines of inquiry. At the time when a complete literary work is first taken up at school, which will probably be when the pupils are about twelve or thirteen, it is surely safe to trust to curing defects of spelling and phraseology through a growing acquaintance with good models, and the individual practice in oral and written composition that would naturally accompany it. In this view, the reading of an author in junior forms may be held to include parsing, analysis, etymology, and other similar exercises; but as these have their own methods of treatment, they need not be considered at present.

Keeping to what arises directly out of the reading lesson, we may find it convenient to class the lines of study under five headings :

(1) Elocution; (2) Meanings and Uses of Words; (3) Allusions; (4) Paraphrasing and Composition; (5) Literary Criticism.

All these are in some degree essential, if there is to be any adequate understanding of the author's meaning, and a full enjoyment of his artistic achievement. Yet it will rarely be found that they all receive due attention. One or another is apt to be crowded out, either through want of time and consideration or from lack of aptitude in the teacher. There is certainly a great disregard in our schools of the educative value of reading aloud. Yet it can hardly be questioned that this is the best way of introducing a class to the study of a work of literature. It is not only

that every opportunity should be taken of developing the faculty of effective vocal expression; the practice has a direct bearing on the appreciation of the author's purpose and methods. After all, the written language is but a pale reflection of the spoken word, and silent reading can be a satisfactory substitute only for those who have had time to cultivate an imaginative sense of sound effects. Young people need the stimulus of immediate sense-perceptions, of the ear as well as of the eye. At the outset of a secondary course, indeed, it can hardly be assumed that even a correct articulation has been acquired by all; but apart from the necessary corrections of individual errors of accent and pronunciation, there is a distinct gain, both to speakers and to listeners, in the audible rendering of a work of literary art, especially in the case of poetry or drama, where the æsthetic intention is at its highest. In order that the interests of all may be considered, it is desirable that the teacher, who may be presumed to have some elocutionary gift, should alternate his own contributions with the less mature efforts of his pupils, and should, by precept and criticism, as well as by example, show how the full force of the author's meaning can best be brought out.

This preliminary reading aloud of the passage to be studied should not be interrupted by any questions or explanations that are not imperatively needed to secure the proper elocutionary rendering, for it is important that the intellectual and emotional appeal should not be dissipated by detachment of the parts. On the second reading, however, which may be taken somewhat rapidly by the teacher, the more detailed examination may with advantage turn frequently from one mode of treatment to another. The object now is to help the pupils to master all the particular difficulties that stand in the way of a complete understanding, and there is an obvious saving of time, and a gain in variety of interest, in taking these as they come, whatever may be their nature. In one line it may be the meaning of some unusual word, in the next the unaccustomed use of a familiar word, in the following line some historical or geographical or literary allusion, in the next a figure of speech to be explained. Then every now and again the meaning of a whole sentence may seem somewhat obscure, and a paraphrase of it will have to be supplied, or the connection between one paragraph and another may have to be traced. The best teaching here will be that which has the widest reach and the most unexpected transitions, provided always that the illustrative and explanatory matter is really relevant, and that as much as possible is got out of the pupils, by leading them to rely on their own resources.

A question arises at this point as to the nature and amount of the private preparation that should be required for such a lesson. It will probably be found best to have the preliminary reading in class before it is studied at home, and to take occasion then to clear up any general difficulties

that seem too great to be left to the unaided efforts of the pupils. Of course, no line can be drawn for this distinction without reference to the age and special circumstances of the class, but it may be urged, as a general rule, that where access can be had to suitable books of reference, a great deal should be left to the pupils' own initiative. Where annotated editions of the informative type are used, there is no value whatever in home preparation, which is merely an exercise of verbal memory; but if there is an assurance that the pupils will have to pursue some independent investigation, and use their judgment in seeking for explanations, it can hardly be doubted that the effort is well worth making. There is, however, a different kind of preparation still in vogue in some quarters, which in most cases is certainly out of place. It is not uncommon to find an acquaintance with the subject-matter of a reading lesson required, in oral or written examinations, even when the book is a record of purely imaginary events, and is not in the front rank of literary classics. It is allowable to expect an intimate knowledge of the details of the plot in one of Shakespeare's tragedies or Scott's historical novels, but such questions as "What did John Silver do after that?" or "Where did Traddles' mother live?" show a misconception of the ends which the teaching of literature must always have in view.

There remains to be considered the somewhat difficult question as to how far a genuine aesthetic criticism can be associated with the literature lesson. There is a great idea nowadays of emphasising this side of English teaching, and, however sound may be the intention, there is no doubt that a good deal of what passes under the name of literary appreciation on the part of young learners has very little substance or value. There has been a natural reaction from the ultra-analytic and philological methods with which the study of English literature was long infected through the influence of a pedantic classical scholarship, and now the cry is all for a more humanistic treatment. In so far as this demand merely expresses a desire that young people should be introduced to the masterpieces of literary art in such a way that they will feel their power and beauty, it is worthy of the highest respect. But beyond the simple presentation of works that are appropriate in their appeal to the stage of development reached, how is it to be effected?

Take a ballad such as "The Revenge," which could not fail to interest and move every boy and girl in any form of the secondary course. What can the teacher do to secure that this poem should make the strongest impression? He can read it to the class with the fullest elocutionary effect that he is capable of; he can help his pupils to read it or recite it for themselves; and he can explain and amplify any words, or phrases, or allusions that may not be fully understood. It may be seriously doubted whether he can do anything more that will add to the emotional impression. If

he proceeds to draw attention to the technique of the poem—to explain its structure, its metre, its diction, its imagery—he is entering upon a very interesting and instructive, but purely analytical study, not directly connected with the appreciation of literature, which, except in its simplest elements, would in any case be suitable only for the higher forms.

Let us see how the case stands with a Shakespeare play, where the so-called critical treatment is most frequently attempted. After the text has been fully explained, and the dramatic effect realised as far as is possible through reading and declaiming in character, what is left to be done? Probably nothing that would add to the appreciation of the particular play that has been studied, and for those who are just being introduced to Shakespeare it would certainly be best to pass on at once to the treatment of others of his plays in the same manner. It is true that valuable exercises in composition may be found in the reproduction, both orally and in writing, of the impressions gained in reading the play. But the important point to be noted is that *these cannot be made the subject of direct teaching*. In so far as the material for the estimation of one of the characters is communicated by the teacher, or supplied by the annotations of the text, or even suggested by different members of the class for each other's benefit, it is worse than valueless. It is bad enough to be crammed with information that has been mechanically acquired, but it is much worse to be crammed with second-hand criticism, and to be misled into putting it forward as if it were the fruit of independent thinking. Of course, the teacher can give indirect help after the event. He can criticise the essay, showing where the presentation of the character has been misunderstood, and giving some aid towards forming sounder judgments for the future. This is the only sense in which the higher appreciation of literature can be enriched and quickened in the average learner, and teachers would do well to limit themselves to it until the latest years of a prolonged school life have been reached. There could be no greater mistake than to impose theoretic lessons on style, or reviews of literary history, on pupils whose reading has been meagre; the time would be far better spent in increasing their first-hand acquaintance with the masterpieces of literature.

The Study of Plant-life for Young People. By M. C. Stopes. xii+202 pp. (Moring.) 2s. 6d. net.—Dr. Stope's little book easily falls into the front rank of the recent attempts to induce children to learn the main facts of plant-life for themselves by direct observation and reasoning. The author displays on every page her practical experience of the pitfalls which beset the path of the raw beginner in botany, and succeeds admirably in being lucid without any sacrifice of accuracy. The greater part of the book covers the usual ground of a first course of experimental botany, but part v., on "Plants in their Homes," is more novel, and will furnish welcome hints on outdoor work. The book is well illustrated by sketches and reproductions of photographs.

RECENT CONTRIBUTIONS TO THE STUDY OF CHEMICAL CHANGE.

By W. A. DAVIS, B.Sc. (Lond.),
Demonstrator in Chemistry, Central Technical College,
London.

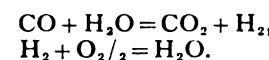
II.—THE PROBLEMS OF COMBUSTION.

IN a series of lectures given at the Royal Institution about the middle of last century on the "Chemical History of a Candle," Faraday taught that "the forces which hold the carbon and hydrogen together are so nicely balanced that the hydrogen is made to combine first, the carbon afterwards." The formation of smoke above the flame of a lamp or candle would in this way receive a satisfactory explanation. But recent work has shown that combustion is far too complicated a process to be explained by considering merely one line of evidence. During the past twenty years the problems it affords have been the subject of a discussion of almost metaphysical subtlety. In the present series of articles it is impossible to do more than draw attention to some of the principal results which have been arrived at by the chief workers in this field of inquiry.¹

In teaching chemistry it has long been customary to illustrate the force of "chemical affinity" by such experiments as burning phosphorus in oxygen, sodium in chlorine, or by exploding hydrogen with oxygen. It has been usual to say that when a substance such as phosphorus is heated in oxygen above a certain temperature called the ignition temperature, combination occurs in consequence of the "affinity" of the two substances for one another. The view taken of chemical action has been the simplest possible one: namely, that the two substances combine together in virtue of a mutual attraction. As a matter of fact, however, chemical interaction is a more complicated business: not only must there be the "tendency" to combine—represented by the possibility of heat or energy being set free in the action²—but, in addition, certain conditions which allow of this energy being dissipated have to be fulfilled before the tendency can be transformed into action.

One of the earliest observations on the inability of two substances, possessing great "affinity" for each other, to interact, is that of Wanklyn, who, in 1869, showed that sodium would not burn in dried chlorine. This observation was confirmed by Cowper in 1883. In 1880 Prof. H. B. Dixon stated, at the Swansea meeting of the British Association, that, although an ordinarily prepared mixture of carbon monoxide with oxygen explodes violently when sparked,

forming carbon dioxide, it is impossible to bring about interaction of the gases if the mixture be carefully dried beforehand. The full description of the work on which this statement was based was published in the *Philosophical Transactions* of the Royal Society for 1884. The remarkable result was then established that a mixture of purified carbon monoxide with purified oxygen could not be made to explode by passing a torrent of sparks; but that if the non-explosive mixture were allowed to stand *for a few seconds* with a drop of water the mixture at once exploded on passing a spark through it. In 1885 Traube showed that a flame of dry carbonic oxide which burned in ordinary moist air was extinguished when plunged into air which had been carefully dried by means of concentrated sulphuric acid. Dixon considered that carbonic oxide "is incapable of direct union with oxygen, but is burnt indirectly by steam with liberation of hydrogen." The steam was supposed to act as a carrier of oxygen by a process of alternate oxidation and reduction, thus:



The assumption made was that hydrogen and oxygen are always capable of directly combining: "the union of oxygen and hydrogen is not affected by the presence or absence of water."

Shortly after Dixon's discovery of the incombustibility of carbonic oxide, Prof. H. B. Baker showed, early in 1885, that the occurrence of other common actions was dependent on the presence of moisture. Dried carbon and dried phosphorus were shown not to inflame in dried oxygen: it was found possible indeed to distil phosphorus in an atmosphere of dried oxygen. No result could be more striking, phosphorus being usually regarded as the most inflammable of substances. Dry ammonia and dry hydrogen chloride when brought together do not combine to form a cloud of ammonium chloride such as that obtained when these substances ordinarily come together; whilst nitric oxide and oxygen in a state of dryness can be mixed together without giving rise to the red vapour of nitrogen dioxide.

In discussing these results in 1885 Prof. Armstrong expressed the opinion that, chemical action being essentially *reversed electrolysis*, it is necessary, in order that chemical action may occur in these cases, that a conducting system be present containing an electrolyte. The significance of this conception has already been illustrated in one special case—the rusting of iron—in the previous article in *THE SCHOOL WORLD* (January, 1907). If this view be admitted as correct it should be impossible to explode a mixture of pure hydrogen and pure oxygen, for both these substances are non-electrolytes: their interaction under ordinary conditions must be determined by some substance which gives rise to a conducting medium. Water alone would be insufficient to effect this result because pure water

¹ For a more complete account of the problem, see Prof. Armstrong's lecture to the Society of Chemical Industry on the "Mechanics of Fire," May 15th, 1905; Prof. Dixon's address before the German Chemical Society, published in the *Berichte*, 1905, p. 2419; and for the general question of the "Nature of Chemical Change and the Conditions which Determine it," Prof. Armstrong's Presidential Address to the Chemical Society in 1885.

² The heat evolved by the union of phosphorus and oxygen to form P_2O_5 is 470,000 calories; that due to the action $\text{H}_2 + \text{O}_{2/2} = \text{H}_2\text{O}$ is 68,300 calories; whilst the action $\text{Na} + \text{Cl} = \text{NaCl}$ gives 97,900 calories.

is in all probability a non-electrolyte; but a trace of an acid or of a salt, by rendering the water capable of conveying a current, would enable action to take place. Thus, on theoretical grounds it was predicted that if sufficiently purified so as to ensure the absence of an "electrolyte," even moist hydrogen and oxygen should not interact when heated together. After many failures to obtain the gases of a sufficient degree of purity, Prof. H. B. Baker succeeded in 1902 (*Transactions of the Chemical Society*, vol. lxxxi., p. 400) in verifying this prediction, made many years previously, by obtaining a mixture of the two gases in the proportion of two volumes of hydrogen to one of oxygen, which could be heated at the temperature at which silver melts

(that is, above 1000°) without exploding.

The method used to prepare the gases consisted in electrolysing a solution of highly purified barium hydroxide. The hydrogen obtained in this way does not contain hydrocarbons, whilst the oxygen is apparently free from ozone or hydrogen peroxide. The mixed gases were collected in a tube of the shape indicated in Fig. 1. In order to ensure success, it was found to be essential that the

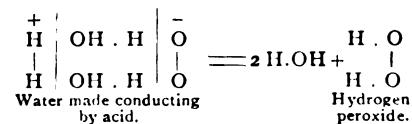
Apparatus to show that a mixture of highly purified hydrogen and oxygen does not explode when heated.

tubes should be made either of hard Jena or hard Bohemian glass. The tubes were first thoroughly cleansed by heating in them a mixture of nitric and chromic acids, and subsequently distilling through them for about an hour purified water from the platinum tube of a condenser. After allowing the tubes to drain they were dried by heating them to redness and passing a current of air, dried by means of distilled sulphuric acid, through them. A plug of distilled phosphoric oxide was introduced, the upper end of the tube drawn off, and the lower end drawn out to a capillary of about $\frac{1}{2}$ mm. diameter. A small piece of fusible metal was introduced, and the tube was exhausted. It was then connected with the electrolysis apparatus, the mixed gases being roughly dried by passing them through a tube of phosphoric oxide a foot in length. When the tube was full of gas the fusible metal was melted and allowed to run

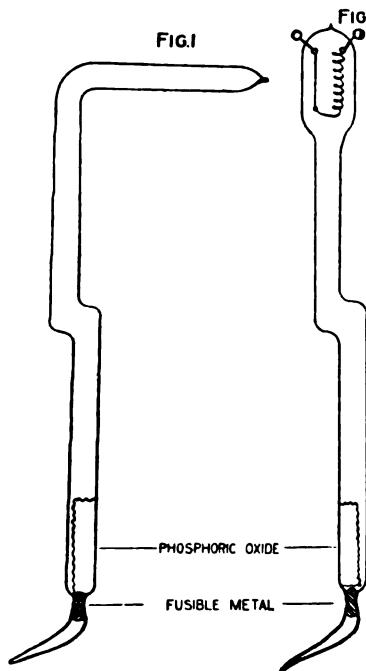
into the capillary; the latter was then sealed, and the tube allowed to remain in the dark for varying periods. After ten days' drying, a tube prepared in this way was heated in a Bunsen burner flame side by side with a similar tube containing undried gas. In twelve experiments the wet tube exploded and the dried tube did not. In two experiments, where only two days' drying had been allowed, water was slowly formed in the dry tube, but although visible moisture was present, no explosive combination took place and only a slow combination occurred. In the undried tubes it was found that combination occurred between the gases, even at the ordinary temperature, when the tubes were exposed to daylight: it was, therefore, essential in drying the gas to keep the tubes in darkness.

The temperature at which a mixture of hydrogen and oxygen explodes under ordinary conditions has been stated to be about 600°. In Fig. 2 the arrangement is shown by means of which Prof. H. B. Baker succeeded in heating a mixture of the gases to a temperature above 1000° without causing an explosion. The hard glass tube containing the gases carries a thin coil of silver wire attached by fusion to platinum wires sealed through the walls of the tube. When the precautions already described were observed, it was found that the silver wire could be heated by means of a current of electricity until it fused, without an explosion occurring. If, however, a coil of thin platinum wire was substituted for the silver one in this experiment, an explosion of the gases always occurred when the temperature of the coil was raised by the current just above the point of visible redness. At this temperature platinum appears to exercise on the dry gases a "catalytic" influence which conditions interaction; but, on the other hand, it was found that the formation of water could not be detected at the ordinary temperature, platinum being then inactive.

The essential condition determining the interaction of hydrogen and oxygen appears to be the presence of an electrolyte, such as water rendered conducting by the presence of a trace of an impurity. The same condition was shown in the previous article to be necessary before iron could rust in presence of air and water; and it is probably the same condition which has to be fulfilled before carbon monoxide will burn in oxygen. In the case of hydrogen the oxidation or burning is accomplished by the completion of a circuit, which may be represented thus:



The hydrogen and oxygen may be considered as the positive and negative poles (as they actually are in Grove's gas battery), and the reversed electrolysis gives rise to the two products shown on the right-hand side of the equation, namely, water and hydrogen peroxide. Such a view of



the action explains the fact that hydrogen peroxide is always formed when a hydrogen flame burns in air; it can, indeed, be detected by playing the hot flame on ice and subsequently applying the titanic acid test for hydrogen peroxide to the liquid. That hydrogen peroxide does not usually accumulate in the water formed is due to the fact that it is an unstable substance under the conditions in which it is formed; giving rise to water and oxygen, and perhaps playing a part in the burning of the hydrogen by acting as an oxidising agent.

The burning of hydrogen is the simplest case of combustion that can be considered. Hydrogen is the principal constituent of ordinary coal gas, forming some 50 per cent. by volume; about 35 to 40 per cent. of coal gas is the hydrocarbon methane or marsh gas, CH_4 . In the next article the operations which occur in the burning of this substance will be considered, and we shall then be in a position to deal with the case of Faraday's candle-flame which fifty years ago seemed to present so little difficulty.

ATHLETICS IN DAY SCHOOLS.

By HERBERT J. TIFFEN, M.A.
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NO one who read the article on "Sports without Prizes" in THE SCHOOL WORLD (May, 1906) can have failed to recognise the cogency of the arguments which the writer put forward. If, however, others have hesitated hitherto to follow the lead of Manchester Grammar School in this matter, it may perhaps afford them some encouragement to hear of the entire success of a similar experiment at the Liverpool Institute. A similar scheme of inter-form competition was tried, and its success surprised all observers. Not only was the number of entrants and of entries far more than doubled, but the interest shown by the school was far keener and more universal.

It was felt, however, that the encouragement of *esprit de corps*, though perhaps the most important of the aims of athletics in our schools, was not their only aim. They should also serve the direct purpose of discovering and developing certain capabilities with which nature has endowed boys, which in town life especially do not find elsewhere a chance of systematic development. Many a natural athlete passes through his school life without ever discovering that he can jump, or run, or throw, and even for those whose natural abilities in these directions are slight it seems wise to take some trouble to develop such slight talent as they possess. It cannot, I fear, be contended that in our day schools the annual sports, as generally managed, do very much to serve either of these ends.

In the boarding school it is different. The athletic grounds are generally close to the school, and the appearance of the jumping standards, together with the various preparations of the ground, announce that the time for the sports is near at hand. Moreover, in the lack of other separate in-

dividual interests, boys turn naturally to the discussion of the prospects of the year and to training. The day-school boy living apart, and often at a considerable distance from the school grounds, feels these influences much less, and the mere issuing of notices and entry forms fails to bring them home to him. Even if he does enter his name, the difficulties of trams and railways cause training to be often altogether neglected, and without training it seems probable that the excessive exertions of one or two days of sports will injure rather than assist the natural development of his powers. The only boy who is likely to train at all is the one who has happened to win a race in the past, and even he will very likely do so with the feeling that it is wise to conceal his actions from the knowledge of his fellows, a frame of mind which, it is needless to say, it is desirable in every way to discourage. If a boy never has been successful and is diffident as to his powers, he will pass the sports by as being of little or no interest to himself, and not only will not train but will not even enter for the races.

It is exactly such a boy, however, who deserves most of our consideration. The pushing youth, who enters for everything and revels in the congratulations of his relatives and friends, may be left to look after himself. A little advice as to methods of training and moderation in its conduct is all that he needs, together with an occasional hint as to style and a reminder that others have claims and rights as great as his own. The naturally sluggish or diffident needs a different treatment. He must be led by encouragement to make the necessary effort, and to discover that he also has powers which it is worth his while to develop. The chief difficulty is to induce him to take the first step in training. Once this is taken he will probably be able to continue in his course, and especially so if he has the encouragement of his comrades to urge him on, but to natural sluggishness or hesitancy the cost of this first step proves generally too great.

In order, then, to attain both these ends, viz., the discovery and the development of athletic capabilities, a system of "form sports" was introduced at Liverpool as a preliminary to those of the school at large. The boys of each form in the middle of the school were allowed out in turn during one hour of work-time on condition that they presented themselves at the athletic ground and did some training there. This hour was always the last hour of afternoon school, and the grace thus given prevented the interference with home-work which might have occurred had it not been granted. When on the ground, the boys were put through some simple events, such as jumping, throwing the cricket-ball, and short and long races. In no case was there any attempt to attain to finality of result, but the sport was no less enjoyable for that, and the twofold purpose was attained of giving to every boy at least a little training, and of helping the form captains to discover which individuals it was worth their while to urge to enter for the school events. Moreover, the necessity for beginning these form sports two or three weeks be-

fore the school sports served to bring more prominently before the other boys in the school the idea that the time for the latter was at hand, and so led to an earlier commencement of systematic practice than had previously been the case. The form sports themselves did not take more than an hour or so, and therefore did not interfere with other games which might be going on, while, on the other hand, the mere fact that they were in progress led to a larger attendance of boys who came to look on and then turned to cricket practice or individual training for themselves.

How far these preliminary sports assisted in producing the successful result of the school sports it is difficult to say. The change in the prize system undoubtedly had great influence, and the brilliance of the weather assisted; but it may fairly be claimed that, at any rate, a few boys discovered in themselves powers which they were not aware that they possessed, and that others were enabled to develop more fully those powers with which nature had endowed them. Certainly it is intended to continue the experiment in coming years with the hope that in future the annual athletic sports may no longer yield so slight a return for the great expenditure of time, trouble, and money, which they must necessarily involve.

UNIVERSITY EDUCATION IN IRELAND.¹

THE report of the Royal Commission on Trinity College and the University of Dublin, recently issued, is the necessary complement of the work of the Commission which sat in 1901 to consider the question of university education apart from Trinity College. The object of both has been to find some means of satisfying the claims of Roman Catholics to higher education, the point at issue being that they require a university or university college with a Roman Catholic atmosphere, while the tendency of English democracy has been away from exclusive denominationalism in university education. The Catholic claim has been admitted to be just by many successive Governments, and the failure to satisfy it is fraught with much political and social danger, while the whole progress of primary and secondary education is seriously retarded. It is regrettable, therefore, that neither of these reports is wholly satisfactory. That of 1901 was discounted by the exclusion of Trinity College from its scope, and the present is unfortunately so lacking in unanimity that on the main question of a practical solution its general effect is negative.

On the secondary, but important question, however, of the internal reforms of Trinity College itself it is, happily, unanimous. While the commissioners accord it high praise as a "satisfactory organ for the higher education of the Episcopalian Protestants of Ireland," they make numerous recommendations which are generally

admitted to be necessary and calculated to improve it greatly. A mere enumeration of the principal points touched upon will show the width of their scope. They include the friendly relations of Trinity to other religious denominations and university colleges; the reconstitution of the governing body and council; the courses of study, election to fellowships, reduction of examinations, insistence upon residence, control of the Divinity schools, the encouragement of Irish and of post-graduate research, and the recognition of outside women's colleges.

On the main question five solutions are mentioned: (1) A modification of Trinity to suit Roman Catholics: this is dismissed as impracticable in view of the statements of the Roman Catholic episcopate. (2) A separate university which, although without tests, shall be satisfactory to Roman Catholics, with or without another university in Belfast: this is held not to be feasible. The other three are (3) the establishment of a new college in Dublin University suitable for Roman Catholics; (4) the establishment within Dublin University of three or perhaps four additional residential colleges, viz., the Queen's Colleges at Belfast, Cork, and perhaps Galway, with a new college in Dublin for Roman Catholics; and (5) the establishment of a duly equipped college for Roman Catholics in the Royal University as recommended by the Commission of 1901.

The question thus narrows itself down to the establishment of what we may call a new Roman Catholic College which will, however, be free from tests. Of the nine commissioners one, Mr. Kelleher, a Roman Catholic and Junior Fellow of Trinity College, objects *in toto* to this as unreasonable, gravely injurious to the interests of Irish lay Catholics, and likely to be dangerous at no distant date to the peace of the country. Three, Lord Justice Fry (the president), Sir Arthur Rücker, and Dr. Butcher, are decidedly for the last suggestion. A new college in Dublin University would lead, they think, to friction, jealousy, and a lowering of the academic standard. The federal scheme under Dublin University would have the same result, and has besides been objected to by all parties, by Trinity, by the Catholic hierarchy, by all the Queen's Colleges, and by the Catholic University College in Stephen's Green. Federal universities have proved a failure, and a federated Dublin University would tend to disruption, in the meantime doing Trinity cruel harm.

The other five commissioners, Chief Baron Palles, Sir Thomas Raleigh, Prof. Jackson, Dr. Douglas Hyde, and Dr. Coffey, on the contrary, approve of a federated Dublin University as the best scheme, but are not all of them equally decided. They are careful to explain that what they propose is not the ordinary idea of a university; practically each college would be autonomous, the university merely prescribing general rules for matriculation and appointing university examiners to assist the college examiners at

¹ Royal Commission on Trinity College, Dublin, and the University of Dublin. Final Report of the Commissioners. (Cd. 3311.) 8*vols.*

the final examinations for degrees so as to maintain a uniform standard. They think that in the present stage of the Queen's Colleges a federal university is a necessity, and while under their scheme Trinity would remain practically as at present, the other colleges would be raised to her level, and this would be impossible under the other scheme. At the same time, the other colleges would develop on more modern lines than Trinity. Chapels would be erected at private expense in each of the colleges. This scheme, it is agreed, will require the co-operation of Irishmen of different Churches, and without this will not succeed.

Prof. Jackson does not think this co-operation likely, and therefore refuses "to take the responsibility of recommending immediate action." Drs. Hyde and Coffey, again, while recommending the above scheme, have no objection to two teaching universities in Dublin.

THE TRAINING OF A NATION.

FOR some time past the physical side of education has filled an important part in the current literature of that subject. More and more clearly it has been realised that the intellectual and moral training of the individual can be achieved but imperfectly, if the physical side of his dual nature be regarded with indifference. With equal certainty it has been demonstrated that any educational system applied by routine methods and with equal rigidity to the intelligent and the mentally deficient, the sick and the healthy, the well-fed and the starving, involves—even if judged only by a standard of immediate "results"—a futile waste of misapplied energy. Still more recently, partly as the result of extended information and partly as a discovery following closely on the heels of latter-day legislation, the nation has been confronted by the fact that the majority of the children for whom it had undertaken to provide an education, both compulsory and free, are physically unfitted to benefit by the methods which it has ordained for their training.

The problem thus presented is a huge one, but not more vast than its importance: for no one at all acquainted with the subject can doubt that upon the courage with which it is faced and the means devised for its solution must depend the status and the welfare of the English nation in the near future. It is admitted that children must be adequately fed and clothed and cared for, safeguarded from preventable disease, properly treated in illness, removed from vicious surroundings and as far as possible protected from their influence, if their education is to be a practical good and its results worth securing. It is also granted that in very many instances the conditions presupposed do not exist, and cannot be ensured in the circumstances obtaining at present; and, further, that there is, besides, no inconsiderable number of children who, by reason of inherited disease,

congenital imperfections, or defective development, can be dealt with only by special methods adapted to their several capacities. The object is one demanding national effort, if only for the sake of substituting a national asset of inestimable value for an imminent national danger. How is it to be achieved—and that without destroying the self-respect of the parent and weakening the sense of filial obligation in his offspring?

As would be expected, the case is presented by Sir John Gorst¹ in terms both powerful and lucid. His remedies are frankly socialistic in character: but, as he points out, not more socialistic in principle than the free vaccination and the free education to which the country is already committed; not more so, indeed, than is the principle which lies at the heart of the various "Grants in Aid" with which recent legislation has familiarised us. But whatever conclusion the reader may come to on this head, the book is one which appeals to an audience far wider than the circle of the "pure educationists." It deals with the making and the marring of the manhood and womanhood of the country. It treats in plain language, and with an authority either personal or directly quoted, of all the important aspects of a question which is as many-sided as the human nature with which it deals. It opens luminous avenues of illustration and suggestion, and enables us to see what is being done in other countries to grapple with the problem, how far their methods have been successful, and in what details they contrast with our own attempts in similar directions. Though the practical help which one might have hoped to gain from foreign examples, encouraging enough in their results, is somewhat discounted if it be true that "probably the wild independence of the British worker would make it difficult to induce him to accept such a legal obligation" as is implied by "the compulsion exercised" (as in Germany) "on the worker by a paternal and benevolent Government compelling everybody to do that which the prudent and thrifty would do of their own accord."

The book is one to be read and pondered; it could not be fairly criticised without considering it in detail. But we may be allowed to take exception to its title. The children of the nation means nothing less than all the children of all the parents whose aggregation forms the nation. Straining the phrase to signify only the children of the relatively poor, and of the thrifless, the idle, and the vicious, reduces it in value to little more than a mere catchword—which one is the more inclined to resent because the book stands in no need of meretricious advertisement.

If it be true that in the multitude of counsellors there is wisdom, the volume of the

¹ "The Children of the Nation." By the Right Hon. Sir John E. Gorst. 297 pp. (Methuen) 7s. 6d. net.

steadily flowing stream of books on school hygiene¹ may bear more than one interpretation. At all events, it is certain, since medicine is, no less than education, a living and progressive science, that the world must wait for very long before meeting with the book which combines the best of all its predecessors with the defects of none of them. Dr. Porter has published an expansion of his lectures to the school teachers of Sheffield. The book is well illustrated, and forms a full compendium of more than all that with which the advanced teacher might fairly be expected to be familiar. It would be useful as a work of reference, and invaluable in this respect to such members of the profession as naturally take a special interest in the subject. But it is open to the too common objection that human anatomy and physiology cannot be *taught* in detail, to any really useful purpose, by letterpress and woodcuts only. And, while a knowledge of the main facts, and of their significance, is admittedly essential to any intelligent handling of even the rudiments of such subjects by the teacher, it seems scarcely fair to imply that mere book-learning so detailed is requisite for the mental equipment of those whose time and energy are already heavily taxed. If the matter were reduced by one-third of its bulk and printed in type proportionately larger, it would still better meet the needs of those for whom it is intended.

The papers reprinted by Dr. Mackenzie in his "Health of the School Child"² are pleasant to read by reason of the restful type employed; and the information they convey is easily assimilated, if somewhat diffuse in form. They might serve as a useful commentary on some other literature more detailed and more dry; for they contain not a little valuable information presented in terms almost pleasantly conversational. Now and again we may doubt whether the author really means what he implies; as when, after stating that "properly regulated physical exercise not only promotes growth, but is essential to it," he adds, "by exercise I mean irresponsible exercise—which is 'play'—not responsible exercise, which is 'work.'" The healthy child is, fortunately, not an introspective analyst; but what becomes of the moral advantages—and, indeed, the "physical regulation"—of school games, if the cricketer, for instance, be irresponsible to his house or his school, to his captain, or to his own self-respect?

Some education of the parents is the necessary corollary of an awakening to the significance of all that is implied in the true education of their children. The Home Education Series has done good work to this end, and this³ is one of the best of its issues. There is no parent but is likely to be the wiser for reading it, and no child but should be the better and the happier

in consequence. There are other forms of knowledge both necessary and useful: that which may be learned from these pages is such as makes for the suavity as well as the wisdom of human intercourse.

EN HOEXKENS ENDE BOEXKENS—A REVIEWER'S FANTASY.

I SAT in my library, a parcel of books at my feet, and looked round for a motto for an unorthodox reviewer. And my eye fell on the words written above, familiar to the readers of the life of Thomas à Kempis. I must have dozed; for the books stood up round me open, a curtain filmed itself before them, and (as we have all been to the play at Christmas time) two bars of curtain music sounded, and the stage was revealed.¹ Enter from left "The Scalp Hunters," price 1s., dressed in red, and gently put forward by Mr. Henry Frowde. With many illustrations accompanying him (all belonging to the Boy's Classics) he bowed sternly to "Captain Singleton," who, stolen by gypsies and forced to wander, was now continuing his wanderings over the stage. Though the Captain belonged to the same series he was much older than the other, and looked on him as a youngster. The shadows of Reid and Defoe, assured of immortality, enwrapped the two. The audience applauded and the figures faded. Before they had gone, any number of Selections belonging to three old ladies named Epochs came dancing on. There were the Milton crew, the Spenser crew, and the Shakespeare crew. Arranged by their Epochs and under the editorship of Mr. Stobart, who had had them dressed by Mr. E. Arnold for eighteenpence the set, they sang, danced, and recited. I heard "Come live with me and be my love," "Forget not yet," and Echo's song (off stage) "Sweet echo, sweetest nymph." They were accompanied by Introductions so clear that you could see right into them, and each had a bag of notes. Prose Selections danced less lightly but quite gracefully beside them, and among these I saw Lylly with his graceful bow, and dear old Sir Thomas with his inke-horn. I was just getting out my commonplace book, when Mrs. Barnett looked from the prompter's box and requested the orchestra to introduce her "Golden Numbers," a long procession of nobles, marshalled very carefully and arranged for one and fourpence (Sunday dress, two and six) by the costumiers, Messrs. Longmans, Green, and Co. The orchestra looked doubtful for a moment, but when the editor murmured "Dekker, of course," they comprehended and struck up

Art thou poor, but hast thou golden slumbers,
and all the audience shouted, for we knew
what rhymed with "slumbers." On they
came—Father Gilligan, Goblin Market, the Re-
quital, Kubla Khan, with many others not so well
known, and as the last one passed out and left

¹ "School Hygiene and the Laws of Health." By Dr. Charles Porter. 312 pp.; 110 illustrations. (Longmans.) 3s. 6d. net.

² "The Health of the School Child." By Dr. W. L. Mackenzie. 120 pp. (Methuen.) 2s. 6d. net.

³ "Some Studies in the Formation of Character." Vol. v. Home Education Series. 451 pp. (Kegan Paul, Trench and Co.) 3s. 6d. net.

1 We can assure our readers and the publishers that the reviewer *was* awake. Please put down this stage-business to the influence of Pinero and Barrie.—Eds. SCHOOL WORLD.

the stage empty, the last bar of the music whispered,

O sweet content, O sweet, sweet content.

I was stepping forward to thank them when a trumpeter dressed in Elizabethan type announced "a Pageant of Elizabethan Poetry by Arthur Symons." I knew this would be a good show, so I left my speech unspoken. It was, as Mr. Symons and the trumpeter told us (*sotto voce*), a "happy tumult," and all the passion of birth and love, of dance and death, of praise and mockery, went singing by. Of course, the planets were all there; but the lesser stars, Campion and Donne, and Greene and Nash, had their candles lighted too, and Sidney, "the complete lover, the perfect youth and knight," held high a torch, looking if Stella could anywhere be hidden. He found her not; yet round him, in the silences of the music, floated a lovely line, "My true love hath my heart, and I have his." The whole of the Pageant could be had, bound in antique board by publishers named Messrs. Blackie—I think they said it cost 6s.

The stage was for a moment empty, but some quite unfamiliar faces came peeping from the wings and sliding from the flies. I rose to drive them off when one of their number told me they were Minor Poets, and that Mr. Churton Collins was keeping them in order. At this I withdrew, for I knew that if anyone could deal with a minor poet, it was Mr. Collins. Mr. Edward Arnold had printed the crew in a cheap edition. I could not catch all of the Greek motto declaimed by the compiler; and when I looked it up in the *Anthologia*, I found Mr. Collins or Mr. Arnold had made a mistake in the Greek (I like finding out Mr. Collins in a mistake in Greek—he has such an eagle eye for other people's). A list of errata was read out before the show began, but the erratum in the Greek slipped by, unnoticed. The Preface, which spoke for xxii pages, defended the minor poets ably; but I must say I was more interested in those who preceded the sixteenth century than in those who followed. The price of the lot was 3s. 6d.—poor minor poets. Some very beautiful figures, hitherto quite unknown to me, walked, with new pride, in the throng. Mr. Collins had summoned them from sleep.

Then, with nothing to herald her except a pageboy called Stopford Brooke's "Primer" (stuffed so full of facts that they stuck out of him like needles), there walked on a graceful lady (pp. 1-973), for all her size most beautiful, who explained in a modest preface that she was only an attendant on the page, an illustrator, so to speak, of his famous primer. (N.B.—The pageboy himself had written an Introduction for her.) Her name was Kate M. Warren; the price of her book was 7s. 6d. net; and Mr. Archibald Constable had printed it on thin paper, and had otherwise prepared it excellently. There are a few books (like "Eothen" or the "Canterbury Tales" or Herodotus) which I should like to have written; but I never came across an anthology which I would have desired to compile more than this—not even the Golden Treasury. Its chief charm was its

earlier pages, for I did not see the "Nutbrown Maid" until page 250. It passed in minuet steps from the stage, and the pageboy kept talking about it—unnecessarily, I thought, for the book was its own recommendation; I lost my heart to it.

Then, with a final clatter, three books came on arm in arm (R.U.E.), all critical, with eyeglass fixed. One criticised "English Literature from the Norman Conquest to Chaucer." That cost 7s. 6d., and Prof. Schofield of Harvard did the work with the pen of an artist and the eye of a lover. It took him 500 pages, and then he said he hadn't finished. But, bless you, how he did go on. When he wasn't very learned—he seems to have read everything in French and German written on English—he was very delightful; for we not only had excellent advice from him, but admirably done translations from out-of-the-way Romances. I went to the stage door to thank him personally, but I found he had already sailed for the States—where they write so many good books on English literature. Usually they ask the Messrs. Macmillan to publish the books, as in this instance; though Messrs. Macmillan have plenty of other work on their hands, too! I decided to go and learn old French at once, so that I could understand old English. Schofield, be thou my guide.

I was rapidly brought back to England by two English gentlemen, Mr. G. E. Hadow and Mr. W. H. Hadow, of Oxford, who were calling out, "Oyez, oyez, oyez. We allowed Prof. Schofield to go first, because he is an American; but here we present you from the Clarendon Press, price 3s. 6d., in 356 pages, with the 'Oxford Treasury of English Literature,' first instalment. Here you have not only the necessary extracts, but full and clear introductions to them, so that you can understand what you are reading. We give you ideas on literature and inspiration. Read, digest, and read again." Afterwards I discovered I had said all this after reading their admirable preface.

The stage darkened, and the gentleman who had brought on the fantastic Elizabethan Pageant returned (Mr. A. Symons) to introduce to us a book which needed no light from the limes or from the headlights. Dedicated to George Meredith (the so-called "obscure" novelist), this volume was an "Introduction to the Study of Browning" (the so-called "obscure" poet); and long ago, in another form, it had received the praise of Pater and of Browning himself. I hastily looked through its 260 pages, and wherever I looked I saw light. Then I took off my hat and wished it an illuminating journey among the many who, having their own interpretation already, will be glad enough to take Mr. Symons's hand. Mr. Dent, who published it for 3s. 6d., just had a moment or two to spare, and was present on the stage, but a telephone call from Everyman took him away before he had time to speak. As Mr. Symons led his book away the orchestra began:

At the midnight in the silence of the sleep time,
and I recognised "Asolando." So I awoke, and it
was not a dream.

BOOKS FOR THE ENGLISH LESSON.¹

THESE volumes are welcome signs of the interest in English which exists both at home and in the United States. How methodical the teaching of composition is in America appears clearly in the books of the Macmillan Company: some may think it too methodical. All the grammars leave on us the impression that grammatical terminology urgently requires simplification and precise definition. The application of "complement," for example, to the object of a transitive verb seems to us to obscure the difference in force of the predicate in "He becomes a soldier" and "Bravery becomes a soldier." The treatment of "what" is peculiar. One writer regards it as always relative; another says that its use as a relative is illiterate. The truth is that it is interrogative in a sentence like "Tell me what you saw," but relative in Longfellow's "Things are not what they seem," and in thousands of other instances. Again, when we find "doom" derived from "deman," we wish writers of grammars would familiarise themselves with scientific philology.

Both parts of the "Progressive Course" are elementary; they are well planned, and contain very useful exercises. But the writer, seeking, we suppose, to be easily comprehensible to children, makes curious statements, as "A phrase does not contain a verb." If, as he says, "to be" cannot form a predicate, what of its use in "Such things have been"? If there is a demand for lists of "roots," they should be carefully revised and brought up to date.

"Sentence Analysis" is a thoroughly satisfactory book; its explanations and exercises are clear and sensible. We are glad to see the proper distinction made between the objects in "He says 'I will come'" and "He says that he will come."

Prof. Carpenter's scholarly "English Grammar" is, like his other works, well proportioned and lucidly arranged. He is least happy on the verb, where his definition of tense should allow only three forms, but his paradigm presents six. Why does it exclude "am loving" while it includes "have loved"? His threefold names for the conjugations—"regular or weak or consonant" and "irregular or strong or vowel"—show a mixture of methods of division that do

not coincide. Grammarians had better discard "strong" and "weak," except for historic purposes, and, if they use "regular" and "irregular," use these terms rationally.

"The Class-teaching of English Composition," intended for girls, will supply useful material and hints. The chapters on oral composition and the use of pictures are particularly good. Still, it is incomplete when compared with the masterly presentation of the carefully graded course in "Elementary Composition" and "Rhetoric and English Composition." The spelling in these and in the other American books is a drawback. Besides, many of the subjects for composition drawn from American history and life are mysterious to our boys; e.g., "Describe the kitchen after a candy pull."

The two books on précis writing are designed to show how to treat official documents, and may be described as technical. They contain interesting and practical introductions, as well as plenty of material for exercises.

Prof. Emerson, whose longer works on the English language are well known, intends this "Outline" for the general reader, and has avoided abstruse points. Exceptionally interesting are the chapters on the language in different centuries, phonetic change, and spelling. Excessive condensation is responsible for a few misleading statements; e.g., that adjectives have no inflections.

In striking contrast is Prof. Wyld's manual, which, with Germanic industry, discusses the deepest problems of English philology and is consequently only for advanced pupils. It is one of the most important books published on the subject in recent years, and is by a writer thoroughly versed in the latest researches. This is manifest from his chapters on sound change, the Aryan race, Grimm's law, analogy, and early borrowing from Latin. We think Prof. Wyld somewhat hard on those who are not phoneticians. Phonetics, the importance of which we fully recognise, should be valued as a servant, not as a master. All the chapters are provided with references to sources of information. This is exceedingly helpful, but should not take the place of a full treatment of certain points. The French element in Middle English, for example, is summarily treated, and the reader is referred to Skeat's "Principles" and Paul's "Grundriss," works which may not be accessible to everybody. Is it prudent to use "Germanic" to designate the hypothetical ancestor of Gothic, English, and German? We consider it confusing to give "Germanic" a meaning at variance with the established usage of "German." On the whole, however, Prof. Wyld has made a valuable contribution to the scientific method in linguistic study.

For any who wish to plan a complete course in English we suggest the following selection: (1) "Sentence Analysis," (2) Carpenter's "Grammar," (3) "Elementary Composition" or "Rhetoric and English Composition," (4) Emerson's "Outline" or Wyld's "Historical Study."

¹ "Progressive Course in English Grammar and Composition." Part i. 50 pp. (Oliver and Boyd.) 6*d.* Ditto. Part ii. 144 pp. *qd.* "Sentence Analysis for the Lower Forms of Public Schools." By one of the Authors of "The King's English." iv+62 pp. (Clarendon Press.) 1*d.* *qd.*

"English Grammar." By G. R. Carpenter. xvi+215 pp. (The Macmillan Company.) 3*s.* 6*d.* net.

"The Class-teaching of English Composition." By the Principal of St. Mary's Hall, Liverpool. vi+95 pp. (Longmans.) 2*s.*

"Elementary Composition." By D. F. Canfield and G. R. Carpenter. xvi+274 pp. (The Macmillan Company.) 2*s.* net.

"Rhetoric and English Composition." By G. R. Carpenter. xviii+432 pp. (The Macmillan Company.) 4*s.* 6*d.* net.

"Précis and Précis Writing." By A. W. Ready. viii+326 pp. (Bell.) With Key. 4*s.* 6*d.*

"Indexing and Précis-writing." By R. V. N. Hopkins. vi+200 pp. (Marshall.) 2*s.*

"An Outline History of the English Language." By O. F. Emerson. 208 pp. (The Macmillan Company.) 3*s.* 6*d.* net.

"Historical Study of the Mother Tongue." By Prof. H. C. Wyld. xiii+412 pp. (Murray.) 7*s.* 6*d.*

TEACHERS' NOTES ON BRITISH HISTORY, 1688-1906.

By C. S. FEARNSIDE, M.A. (Oxon.).

II.—BRITAIN AND EUROPE, 1688-1748.

In this series of Teachers' Notes I shall, in order to save space, suppress one or two features of the former series, containing information which is now readily accessible elsewhere: for instance, a collection of notable sayings ("for talks or problem work"), such as those which won a good deal of approval in the first series of these Notes, can be obtained for 1688-1715 in the Teachers' Notes in THE SCHOOL WORLD for November, 1900, and for 1714-1848 in two books by Mr. J. S. Lindsey ("Problems and Exercises in British History, 1688-1832," and "Students' Note-Book of European History, 1789-1848"). The bibliographies and topical and chronological synopses in those books give a great deal of help (designed expressly for teachers) in choosing books to read and in checking the results of reading: in these columns, however, I shall try to arrange matters in teaching rather than in testing order. Of the numerous manuals meant for pupils of school age, the most compact, comprehensive, and trustworthy known to me—though in mechanical equipment it leaves much to be desired—is Prof. T. F. Tout's Third Part, dealing with 1689-1901 (Longmans, 2s. 6d.).

I purpose to borrow hints freely from the examiners who have dealt with this period for the Oxford and Cambridge Locals, Joint Board, London Matriculation, Scotch Leaving Certificate, and other examinations, and to deal side by side with British and Foreign History—in accordance

A. British History.

(i) William of Orange, 1689-1702.

(1) PERSONALITY: ancestry; relation to Dutch parties and to Stuarts; predominant interest in international politics; constitutional restraints and difficulties in his various dominions, continental and insular.

(2) ENGLISH CONSTITUTIONAL RESTRICTIONS set forth in *Bill of Rights, 1689*, and *Act of Settlement, 1701* (N.B. their occasions and differences), in *Mutiny Act* and *Triennial Act* (N.B. diverse meanings of "triennial"). Persons: Somers, Locke.

(3) REVOLUTION: differences in causes, course and results in the Three Kingdoms; what parties (a) got, (b) did not get, what they wanted. Terms: Scottish Kirk, Penal Code. Persons: Halifax, Dundee, Tyrconnel, Sarsfield.

(4) FINANCE: meaning and significance of Appropriation, Credit, Bank of England, National Debt. For facts see Macaulay; for constitutional bearing see A. V. Dicey, ch. x. Persons: Montague, Newton.

(5) PARTIES: meaning and recency of names Whig (Scots) and Tory (Irish); differences as regards both political theory (Powers of King and Church) and supporters (Landed v. Monied Interest; Churchmen v. Non-conformists). Terms: Junto, Censorship, Licensing Act, Tacking, Impeachment, Attainder. Persons: Sancroft, Shrewsbury, Fenwick, Defoe.

In both columns here the ordinary text-books largely follow the Whig tradition of Hallam and Macaulay; many fresh and illuminating views can be obtained from Boutamy's "English Constitution" (institutional) Seeley's "British Policy" (international), and especially Acton's "Lecture

with a growing and welcome tendency in British school curricula—and to attempt the partial co-ordination of history with geography and literature. Such a combination of subjects—considered with reference to their antecedents, and with still more reference to the things of to-day—should form an ideal course of study during the closing years of the secondary-school curriculum; and presumably Lord Acton had something of that sort in his mind when he wrote to the contributors to the "Cambridge Modern History": "The recent past contains the key of the present time."

Our first period embraces the two generations following the Protestant Revolution (1688-1748). The most obvious political concern of those two generations was clearly whether that Revolution, like its predecessor, was to be undone by a Restoration: the Forty-five finally decided that question in the negative. Corresponding to that long British Succession question in British home politics were the questions of Spanish, Polish, and Austrian Successions which loomed large in the great wars of the period. And again, looking a little more below the surface—i.e., below the outstanding events which would be discussed in the clubs—we see the development of *constitutional government* in Great Britain, on the basis of a party cabinet, going on simultaneously with the rise of powerful *absolute monarchies* in Russia and Prussia. For these deeper aspects we must turn to such stimulating commentators as Laveissé, Seeley, and Acton—who each provide, in nearly every other sentence, thoughts suitable for a Sixth Form essay: here we have to deal rather with the *narrative stage* of history, which must needs precede the *analytic stage*.

B. Foreign History.

(ii) Louis XIV.'s Supremacy, 1689-1700.

(1) WAR OF GRAND ALLIANCE (or British Succession), 1688-97; considered as the first stage of the "Second Hundred Years' War" in Seeley, "Expansion of England," I., ii. (Macmillan, 4s. net).

(a) *Louis XIV.'s Object*: Supremacy at Home and Abroad; imitation of his domestic policy common among his neighbours, and one cause of Protestant Revolution.

(b) *Various Motives of his Enemies*.

(c) *Theatres of War*: Sea (Beachy Head, 1690; La Hogue, 1692) and Land (Scotland, Ireland, Flanders).

(d) *Peace of Ryswick, 1697*: why made; terms; why and to what extent a draw and a "truce rather than a peace."

(2) PEACE INTERVAL, 1697-1701: mainly occupied with negotiations about the Spanish Succession.

(a) Component Parts of the Spanish Monarchy: which were they and how did they come together?

(b) Claimants: their claims and the objections to each, formal and real.

(c) Partition Treaties, 1698, 1699: terms, motives, failure.

(d) Death of Charles II., 1700: why did Louis XIV. throw over the Partition Treaty and adopt Charles's will, and why was William at first compelled to acknowledge the Bourbon as King of Spain? How did the question directly concern the British Kingdoms?

on Modern History," xiii., xiv. (who deals with both domestic and foreign aspects and exposes mercilessly the want of clear principle and moral scruple in all the leading persons and parties).

(iii) Queen Anne, 1702-14.

(1) ANNE'S PERSONAL CHARACTER: amiable; strong "Churchwoman" (Queen Anne's Bounty); and dependent on favourites. Persons: Sarah Jennings, Abigail Hill.

(2) PARTY HISTORY: the gradual development of Anne's group of Ministers into a Whig Ministry (or Junto), and its sudden replacement in 1711 by a Tory Ministry, both reveal the leading differences at the time between the two parties. Persons: Marlborough, Godolphin, Harley (Oxford); St. John (Bolingbroke).

(3) GODOLPHIN'S UNIFICATIONS: both to be connected with the Scottish Darien Scheme, 1699.

(a) Anglo-Scottish Union, 1707: differences from earlier unions, projected or achieved; motives for determining its making and shaping; limitations to the completeness of the union; *neither in form nor in fact an absorption of Scotland into England*.

(b) East Indian Union, 1708: amalgamation of the rival London and English Companies into a united company; factories, &c., at the time; possibility of European conquest in India foreseen.

(4) CHURCH QUESTIONS: the Tory standpoint in Church matters illustrated by the *Occasional Conformity Act*, *Schism Act*, and *Scottish Lay Patronage Act*.

(5) ILLUSTRATIVE LITERATURE: for Politics, Defoe's "Shortest Way with Dissenters," Arbuthnot's "John Bull," and Swift's "Journal to Stella"; for Society, Addison's "Essays," especially the "Coverley Papers." [Modern: Thackeray's "Esmond."]

"Map-work." The principal campaigns of the period are shown in Reich, Pl. xxx., xxxi. (with useful notes), and in Putzger, xxiiia. (with

(v) The Whig Peace, 1714-40.

(1) THE GUELPH SUCCESSION: the reasons for and against its validity in law and its improbability as a fact; the failure of the Fifteen; the preventive measures known as *Riot Act* (1715) and *Septennial Act* (1716). Persons: James Edward, Mar, Forster.

(2) THE PERSONAL UNION between Britain and Hanover: its constitutional (see *Act of Settlement*) and international (e.g., Bremen and Verden) difficulties.

(3) FIRST WHIG SCHISM, 1717-20: concerning foreign policy. Persons: Stanhope and Sunderland v. Walpole. *Protestant Interests Act*, *Peerage Bill*, *Declaratory Act* (Ireland).

(4) SOUTH SEA BUBBLE, 1720: the speculations of the South Sea Company (to be connected with the Asiento and with the War of Jenkin's Ear), to be kept distinct from the other ventures of the period.

(5) THE ROBINOCRACY, 1721-42: Walpole's striving for peace at home and abroad, even at cost of good schemes like Wood's Halfpence and *Excise Bill* (1733); his insistence on Cabinet solidarity and his own premiership; influence of Queen Caroline; opposition of the Prince of Wales, at the head of the *Patriots* and the *Boys*. Persons: Walpole, Pulteney, Bolingbroke.

(6) ILLUSTRATIVE LITERATURE: Swift's "Drapier's Letters" and "Gulliver's Travels"; Bolingbroke's "Idea of a Patriot King"; Wesley's "Journal" (for rise of *Methodism*).

(vii) Walpole and his Successors, 1740-8.

(1) FALL OF WALPOLE, 1742, due to weariness of one-man rule and of dull peace, as well as to his lack of zeal as War Minister. *Rule Britannia* dates from 1740, and was highly typical of the moment.

(2) RESIGNATION OF WALPOLE, after a serious defeat in

(iv) The Spanish Succession and the Baltic Wars, 1701-13.

(1) VARIOUS MOTIVES OF THE ALLIES: Marlborough the connecting link and mediator.

(2) THEATRES OF WAR: England directly concerned with Sea (Gibraltar), Netherlands (Ramillies, Oudenarde, Malplaquet), Bavaria (Blenheim), Spain (Almanza), and North America; not directly concerned with fighting in Cevennes (Camisards), Italy, and Upper Rhine. Chief Persons: Eugene, Villars.

(3) THE RIVAL CLAIMANTS, Charles and Philip: differences in their leading aims and in the attitude of the various populations of the Spanish dominions to them.

(4) CRISIS: effects on the political situation of Marlborough's Fall and of the succession of the Archduke Charles to Austria and the Empire, both in 1711.

(5) RESULTS OF THE WAR as determined at the Treaties of Utrecht (1713) Rastadt and Baden (1714), collectively known as the *Peace of Utrecht*. The number of the separate treaties testifies to the differences of aims among the "High Allies."

(6) GAINS: what did Great Britain gain by the war (territorially and otherwise), and were her gains as great as she had earned or might reasonably have expected to get? Terms of *Asiento*.

(7) THE NORTHERN WAR between Charles XII. and Peter the Great definitely replaces Sweden by Russia as the dominant Power on the Baltic. N.B.—Sweden was much larger, Russia much smaller, then than now.

coloured patches marking changes of territory). The atlas companion to Alison's "Marlborough" can now be obtained at a low price.

(vi) The Age of Adventurers, 1715-40.

(1) DISCONTENT WITH Utrecht SETTLEMENT, 1713-25: whether at idea or actual nature of partition arranged by the Great Powers over the heads of the rival claimants, Philip and Charles, who did not finally accept the partition until 1725. Questions: Sardinia v. Sicily; Gibraltar; possible union of France and Spain; Bourbon Family Quarrel (until 1731). Persons: Elisabeth Farnese and her advisers, Alberoni and Ripperda; Regent Orleans and Dubois.

(2) END OF NORTHERN WAR at *Treaty of Nystadt*, 1721; Charles XII.'s Jacobite Schemes; his death followed by oligarchic revolution in Sweden.

(3) CHARLES VI.'S TURKISH WARS and his Preoccupation with his *Pragmatic Sanction*. N.B.—Importance of Frederick William I. of Prussia, sometimes called "the real maker of Prussia."

(4) FLEURY-WALPOLE UNDERSTANDING holds fast, despite the strain of the *First Family Compact* (1717), the settlement of Georgia (1733), and the War of the Polish Succession.

(5) INTERNATIONAL DOCUMENTS: care must be taken to distinguish between the several treaties of Vienna, and between the various temporary "alliances" known as Triple, Quadruple (1718), and Hanover (1725).

(6) Map-work: the growth of the outlying Bourbon possessions in Italy.

(viii) The Wars of "Austrian Succession," 1740-8.

The following wars, though contemporary and sometimes involving the same parties, are to be distinguished as regards causes and theatres.

(a) British Wars:

(1) BRITAIN v. SPAIN, 1739-48: "War of Asiento or of

House of Commons, the first definite recognition that a Minister requires support of *Commons* as well as *Crown* (see Mr. Morley's "Walpole"); but his retirement does not involve the retirement of his colleagues.

(3) CARTERET'S ADMINISTRATION, 1742-4: an interesting contrast to Walpole's as regards both politics (he depends solely on King) and policy (he favours an active intervention in Germany). *Persons*: Wilmington, Chesterfield.

(4) PELHAM'S ADMINISTRATION, 1744-54, ends the Second Whig Schism by finding places for all the important Whigs. The years 1748-54 the most uneventful in all Modern History.

(5) THE FORTY-FIVE, 1745-6, after a promising beginning, proved abortive, and was followed by anti-Gaelic legislation for Scotland. *Terms*: Pretender, Hereditary Jurisdiction. *Persons*: Charles Edward, Cope, Cumberland.

(6) MAP-WORK (British and Foreign): Charles Edward's line of march is shown in the atlases of Gardiner and Reich. Putzger has maps showing Europe in 1740, and the principal theatres and campaigns of 1741-63 (xxiiib, xxiva); the British campaigns in the Netherlands are shown in Reich, Pl. xxxiii.

Special pains are taken to make clear the complicated history of the Early Hanoverian Period—by separate treatment of international and constitutional history, by a Geographico-Diplomatic Chart, and by tabular synopses of the Wars—in "The Intermediate Text-book of English History," vol. iv. (1744-1837), by A. J. Evans and C. S. Fearnside (W. B. Clive, 4s. 6d.).

THE BEST CURRICULA FOR SECONDARY SCHOOLS.¹

I.

By G. McCROBEN, M.A.

Headmistress of the Girls' High School, Wakefield.

In speaking of the ideal curriculum we must bear in mind what the aims of education are, and lay down the lines of school work and training with these ends in view. It is a truism that school work is a preparation for the life work that is to follow, but it does not prepare directly for any trade or profession. The real aim, then, is general, not particular, and is that of training character, of preparing the boy or girl to give of his or her best, and to bring a trained intelligence to bear on whatever work he or she may have to do.

We want to give children a desire for knowledge—not to give them so many facts which their overburdened memories will soon let fall, but to kindle in them the desire to find out for themselves, to read and observe for themselves. With these ends, then, of developing character, of training the faculties, and of awaking the desire for knowledge in view, we should plan our curriculum and methods of teaching. The point of view expressed in this paper is naturally that of the ideal curriculum for a girls' secondary school.

At present there is too great a tendency to divide into so many subjects, and to arrange them all in different pigeon-holes of the mind, and this is one of the dangers arising out of too much specialised teaching. History and geography, for instance, are often considered as separate subjects, but, of course, it is impossible to study the one without the other.

I shall therefore group the component parts of training under the following heads: English, other languages,

Jenkin's Ear." Only events: capture of Porto-Bello and Anson's Voyage.

(2) BRITAIN v. FRANCE, 1744-8: did not begin until Austrian Succession was virtually settled, and was fought in India (Clive) and Canada, as well as at sea (Hyères) and in Netherlands (Fontenoy).

(b) Non-British Wars:

(3) AUSTRIA v. PRUSSIA: the Silesian Wars—the first, 1740-2 (ending with Tr. Breslau), the second, 1745-6 (ending with Tr. Berlin): the most notable of the wars from a military standpoint, owing to sudden emergence of Frederick II. of Prussia.

(4) HABSBURG v. WITTELSBACH-WETTIN: "Wars of Austrian Succession," strictly so called, 1741-5. George II. concerned, chiefly in his capacity of Elector and member of the Empire, as ally of Maria Theresa: hence Battle of Dettingen and Convention of Hanau, 1743.

(5) SPAIN v. AUSTRIA, 1741-8: mainly fought in Italy; practically a phase in the long Bourbon-Hapsburg struggle for Italy.

(6) SWEDEN v. RUSSIA, 1741-3: ended by Tr. Åbo.

(7) FRANCE v. NETHERLANDS, 1747-8: B. Lauffeld. N.B.—All the wars that were still going on were ended, but not really settled, at Tr. Aix-la-Chapelle, October, 1748.

science and mathematics, handwork, æsthetics, and physical development.

Of these I have put English first, as it is a fundamental training for girls and boys of all ages and stages of development, and in the term I include the study of English language and literature, of history and geography. It is essential that all children should be trained to read, write, and express themselves in their own language, and this training should be continued throughout the school life. Great attention ought to be given to the power of expression—both orally and in writing—and subjects should be set for essay writing or composition, in which the girls are interested and about which they have plenty to say.

The object of the teacher of English literature is to create and foster a taste for good reading, and to share her own likings and enthusiasm with her girls. With younger children these lessons take the form of stories, and if the stories are well and vividly told, with little descriptive touches, they form a first training in appreciation of what is good in literature. The reading of the girls should be wisely planned, so that a girl who goes up through the school should have opportunities of a good deal of general reading. In order to break down the old idea that books for school reading are different from those for home reading, pretty and well-illustrated copies should be chosen when possible, and the number of cheap but pretty editions of our English classics makes this more possible every year. Also, all texts with notes should be avoided, except in the case of elder girls who know how to use them wisely and benefit by them. A Shakespeare club, is a great help in giving this taste for reading. If possible, this should meet out of school hours, so that a play can be read at one meeting, and if the parts are prepared in advance both the reading and character representation can be good and spirited. Representations of plays are a great educational factor, provided that those who take part in them do not become self-conscious. These representations help the girls to realise the beauty and interest of a poem and the characterisation of a play, and help them also to speak well and clearly. A good

¹ Abridged from papers read at the North of England Education Conference, Bradford, January 4th, 1907.

library is an essential part of a training in English. It is to the literature lessons what a laboratory is to the science lessons, and should be used in the same way, viz., for practical purposes.

I have discussed the English curriculum at great length because it seems to me to be so fundamental in its importance. If we can help the girls to express themselves well, to write their own language, and to appreciate the best English literature, they will be dowered with a gift for life which will be invaluable. The most the best teachers can do is to lay the foundations and to inspire in willing pupils their own love of literature. But to those who can receive it it is the opening of the gate leading to the inexhaustible pleasures of literature and art, and they will never regret the labour spent in getting to the threshold. As Shelley says : "All spirits upon which poetry falls open themselves to receive the wisdom which is mixed with its delight."

In addition to the art of expressing ourselves in our own language, it is obvious that the art of using foreign languages should also find a place in an ideal curriculum. We want foreign languages for communication with foreigners; we want them because they open up new fields of literature; we want them because they give access to new methods of thought. These advantages are at present combined in the fullest degree in the French and German languages, which is the reason for selecting these languages for study at school. The aim in teaching should be the same as in English, viz., to be able to speak, read, and write the language, and not to make it a mere preparation in grammar. French should be begun first, in my opinion, and should be taught by a Frenchwoman conversationally at the beginning.

With regard to the vexed question of Latin, opportunities should be afforded, of course, for the study of this language, but it should not be compulsory.

The third group, science and mathematics, trains such faculties as observation and concentration, accurate statements, and logical reasoning. Such faculties should be acquired in the plastic time of youth; and when the time comes for each boy or girl to do his or her part in the work of the world, they will be found furbished up and ready for use.

The object of a training in science is to encourage a scientific habit of mind, which observes all that goes on in the physical world with a desire to understand it. The foundations should be laid in the little ones in the teaching of what is called nature-study. It is a wide term, and many different text-books have been published suggesting lines on which such training should be conducted; but, as a matter of fact, each really good teacher will make out her own lines, and these must differ greatly according to environment. Nature-study leads up to botany, which, if well and practically taught, adds greatly to the interest of country walks and holidays. All science teaching should be heuristic, and should place a girl in a position to find out something for herself rather than to accept results told to her; but again, a good teacher would not be bound by a system or series of rules laid down for teaching, but would decide for herself how far heuristic teaching is practicable. All science lessons should at first be practical, in touch with common life, and all experiments drawn as far as possible from daily life, and for girls these experiments should be in touch with domestic life. Later, the general experimental science may give place to specialised work in physics or chemistry, or both.

As a part of the science work, every girl should learn

something of the laws affecting herself and her structure, laws of health and hygiene, and some elementary physiology. The health and physical condition of the children of the future depend on the girls of to-day, and it is therefore necessary that they should be trained to know something of their responsibilities and of the care of home and children, which may fall to their lot.

I have called my next section handwork, for want of a more exact name. It enters into most lessons from the Kindergarten upwards, and might be made of still more importance. Boys and girls are often awkward and the reverse of "handy," and need training to use the brains to direct the hands.

Handwork should be a part of lessons as far as possible, and in this we might take a hint from American schools. In history, for instance, the children should make models of dwelling-houses, and in geography more still might be done.

My term handwork also includes domestic arts, as sewing and cookery. All girls should learn to sew, and this should be an essential part of an ideal curriculum. The question of cookery is different, and it should not be begun too young. If a girl is accustomed to intelligent handwork, and has developed to a certain extent the facilities of handiness, careful observation, and accuracy, she will be able to learn to cook later. Every school should provide cookery lessons, but I am inclined to think they are best given to girls of about sixteen or older.

Next, to deal with aesthetics, such as music, singing, and drawing. All these subjects should be included in the school curriculum. In drawing, the visual, mental, and manual powers are all cultivated, and, at the same time, the memory is strengthened and the inventive and imaginative faculties are stimulated. Drawing should not be treated only as a separate subject, but should also enter into many other lessons; and children should be encouraged to treat it as a means of expression and to illustrate stories read or scenes from history and so forth.

I think, too, that an ideal curriculum would always include lessons which help the children to appreciate art, and these should be begun quite young, as early impressions count for so much and are so lasting.

There is no need to insist on physical culture as a necessary part of a school curriculum nowadays, but sometimes the ends in view are lost sight of. We do not aim at turning out athletes, nor at preparing a good school team to win matches in games, but at the development of a sound and healthy body for every girl.

A short period for drill should be given every day to every girl in the school and the drill should be wisely planned and in the hands of an efficient mistress, and should aim at teaching the girls to hold themselves well, to breathe properly, and generally to develop a healthy body. Nor should such training be confined to the gymnasium. If the girls are allowed to sit badly in class the influence of the drill exercises will be counterbalanced. Perhaps few teachers realise the importance of this constant care of the physical development of their pupils. Games are also a great help in physical training; and in girls' secondary schools, where there are few afternoon lessons, there is ample opportunity for these. Such games as fives, in which the left hand is used as much as the right, and which develops both sides of the body, are especially good.

Then, again, the moral training of games must not be lost sight of—the development of public spirit, the unselfishness of playing for the side and not for self, and the self-

restraint which is often needed "to play the game" in the right spirit, to "love the ally with the heart of a brother, hating the foe with a playing at hate."

To turn to the ethical side of school training. It is impossible to separate it from the other sides, as it enters into all lessons and all games. For instance, girls are often apt to jump to conclusions, to want to jump from the beginning to the end and miss out the intermediate steps; a sound training in mathematics, teaching her to come to a conclusion by a series of logically-reasoned steps, will not only train a girl's reasoning and accuracy, but will make her a more just human being and more careful in her judgments. There is a strong movement on foot now to give definite lessons in morality, and make them a part of the school time-table; but I am inclined to think such lessons might tend to become words only, and it is not the girl who can write the best essay on honesty who is the most honest.

Lessons in citizenship are a part of history—management of school societies and games with their committees and organisation paves the way for taking part in schemes of management on a larger scale in after-life.

Development of public spirit is not only fostered in lesson time, but also in all the school life, with its societies, entertainments and games, its Empire Day celebrations, all helping the girls to realise themselves as a part of a community, ready to put aside their individual claims and desires to "help on the larger life" around them, and realising their responsibilities towards their school.

II.

By the Rev. W. H. KEELING, M.A.

Headmaster of Bradford Grammar School.

THE curriculum of a secondary school falls into two divisions, intimately connected, though still distinct. They are :

(1) The curriculum up to the age of specialisation. For this there will be a common range of subjects.

(2) The curriculum for the period of specialisation.

What are the indispensable subjects for the former? Moral and religious teaching is absolutely necessary. Happily, the religious difficulty scarcely exists in secondary boys' schools of the first class. This good fortune we owe largely to the constitution of our schools and to the fact that the teachers are content in their Bible lessons to sink the controversial spirit in the spirit of good citizenship. Moreover, a most effective channel for moral teaching is to be found in the carefulness of the masters to maintain a high tone and healthy corporate life throughout the school.

Secondly, there is physical training, not military training. All the preparatory training necessary for a boy at school, whether directed merely to his physical development or to his future capacity as a defender of his country, is drill and gymnastics. Any special military training that may be needed must be superadded when he is an adult.

Thirdly, we must have good elementary mathematics. But caution is necessary here in view of the extreme attitude of some advocates of practical mathematical methods. Drawing and measurement are excellent handmaids of mathematics in the early stages, but too exclusive devotion to them will rob mathematics of educational value.

History and geography are naturally indispensable subjects, but most indispensable of all is English. The recognition of this fact is rapidly growing. Boys must be

taught not only to read and write, but to speak their own language. The aims of English teaching are mainly two:

First, to give the pupil such an idea of the structure and capabilities of his mother tongue as will permit of his using it, readily and correctly, as a means of spoken and written communication.

Secondly, to inspire him with such a living interest in the literature of his country as shall awaken a sympathetic response in his finer feelings.

We may allow that the first part of this task is performed, more or less adequately, in efficiently conducted primary schools. It is when we come to our second object, the fostering of a literary sense, that the elementary school proves inadequate, and it is precisely here that the secondary school steps in. Being able to command the services of men of a wider and more literary education than is allowed at present by the resources of the primary school, the secondary school starts with the first essential of all good teaching, whatever be the subject—the proper mental equipment of the teacher. More particularly is good English of importance in schools deficient in classical training. No part of the scientific and modern language course offers an adequate substitute for the refining influence exercised by the study of the Greek and Latin literatures. This gap, to a great extent, may be filled by the study of English literature, conducted by men who are competent to bring out its full meaning and spirit.

Besides these subjects, there are others that demand a place—French, Latin, natural science, drawing, and music. French should precede Latin, while any science that is taught at an early stage should take the form of nature-study. At a later stage physics may be introduced, taught in close connection with mathematics. Chemistry should be postponed until the age of fifteen. Good and concentrated teaching of French and Latin in the earlier years—say the first two years of the Board of Education's secondary course—should enable us to lighten the burden of these subjects in the third and fourth years, and to begin the study of German or Greek. The demands, however, of the older universities for their classical scholars are so high that at present it is almost impossible for the classical side to postpone the beginning of Greek to the age of fourteen.

The essential feature, then, of the first part of the curriculum is that it should be general and a sound foundation. The problem is to make this part of the curriculum at once a complete education in itself and a foundation for the superstructure of specialisation to follow. The non-specialised curriculum, embracing as it does a range of necessary and substantial subjects so adjusted that no one faculty is developed at the expense of any other, may provide a common basis for nearly all secondary schools. The relative time devoted to the various subjects in this part of the curriculum will depend on local and other conditions, such as the number of pupils in the school. But on the whole the exclusion of unnecessary subjects will enable almost all secondary schools up to a certain point in their curriculum to be on a common basis, and will render the transference of a pupil from one school to another without distinction of class or caste a more satisfactory and practicable matter than it is at present. A certain measure of uniformity will thus be obtained without any sacrifice of elasticity and individuality. Nor when specialisation begins will the pupil neglect entirely the other branches of learning. For instance, whatever be the special branch taken up, it must be connected with the study of English literature. Specialisation will mean

a continued general study of other branches combined with a more concentrated attention to one particular department.

This brings us to the second part of our curriculum, the period of specialisation, which for the average boy will begin about the age of fifteen. The value to the school as a whole of having a strong top formed of older scholars who are pursuing advanced studies in the great branches of learning can hardly be overestimated. Such a condition of affairs not only compels the provision of competent and brilliant teachers, men of the highest mental equipment and calibre, but is in these days of municipal retrenchment the one inducement to such men to join the staff of any school. To the boys themselves the advantage is great, nor is it confined to the small body of those who intend to take up a university career. The influence of the top spreads downward and pervades the whole. Even in the lower forms the presence of boys who are destined for a university career in the same class-room with those who will leave school early and enter business cannot fail to be of advantage to both.

But the term "specialisation" is misleading. Nothing in the nature of absorption in technical detail can be admitted into schools. By specialisation at school we mean a more intimate acquaintance with great branches of knowledge and a fuller appreciation of subjects in themselves vast and broadening. It is on this ground that any specialisation in such narrow subjects as commercial practice in secondary schools is to be deprecated. The subjects themselves must be broad.

Among such subjects, first and foremost come classics, the widest of all subjects, the key to the highest and best thoughts of the world. Taught not in the spirit of narrow pedantry, but with a generous appreciation of their connection with all manifestations of literary, political, and social excellence, they will be brought into relation with the best English literature, and from them the boy will be taught to acquire a steady vision and intellectual freedom, and to apply to the problems of modern life maxims and principles from the greatest storehouse of wisdom.

The other two alternative branches of study in which I would have specialisation in our defined sense are :

(1) Modern languages, taught not merely with a view to the acquisition of a colloquial facility, but in relation to the best of their literature.

(2) Mathematics and science.

But in all these studies the teaching should be at once advanced and broadening. It should be in direct connection with university work, and will be largely directed by the universities. It will be the function of the universities so to frame their requirements as to ensure the best of such teaching at school. Throughout the whole of the curriculum true education, not mere equipment for livelihood, must be the aim.

In conclusion, it is well to recognise that paper curricula are worthless unless there is some guarantee that they are being earnestly and intelligently followed. We want not only grading of subjects, but grading of progress, if I may use the expression. By this I mean that it is imperative to provide for the execution of any scheme of work in such a way that as far as possible every pupil shares in the progress, and no one is merely marking time. To this end a system of inspection and examination, however unpalatable, is necessary; and such inspection and examination should be experienced, liberal, and sympathetic.

III.

By R. LISHMAN,

Headmaster, Bradford Belle Vue Secondary Boys' School.

In England the force of circumstances has already evolved a type—the municipal secondary school—the main aim of which is to equip pupils more intelligently for the practical life of industry and commerce by broadening their outlook on men and things. My remarks will refer chiefly to schools of this character.

In drawing up a curriculum for any type of school, two apparently contradictory principles should be kept in view :

(1) It should be recognised that the pupil is a being of complex nature and of manifold powers. He is endowed with powers of observation, imagination, and reasoning; he possesses constructive and inventive ability, a sense of beauty of form, colour, and sound, and a capacity for co-operating with his fellows for social ends. These several faculties may be allowed to lie dormant and thus become atrophied, or they may be developed by suitable exercise. If we are to avoid lop-sidedness and secure an all-round, symmetrical development, the curriculum should be ample and varied, and comprise those subjects which are best capable of appealing to every side of the child's nature and of developing every latent power.

(2) In the second place, we must recognise the existence of special aptitudes in every child, a fact simply expressed in the saying of Edward Thring: "Every child can do something well." By discovering and fostering the special natural endowments of the units composing the nation, we employ the best means of securing that "national efficiency" upon which many of our public men have recently laid such stress. It is evident that the national organisation will be most complete and effective when each citizen is doing the work for which he is, by nature, best fitted—in short, when the nation is composed of round men in round holes.

Further, this cultivation of special gifts implies the bringing out of individuality, and the removal of the common reproach against our system of education that it turns out products all of one pattern—men and women who are gregarious, not only in tastes and habits, but in opinions, whether on politics, literature, or art.

Before this can be attempted, however, with any chance of success, the Board of Education will have to relax the present rigid allotment of time to various subjects for all children, in all schools, and in all districts.

Coming now to the details of the curriculum, we are faced at once by the old controversy as to the relative educational values of science and language, or of the utilities and the humanities. Whatever may be our private opinions on this much-debated question, I think it will be generally admitted that the tendency of the times is to abandon what I might term the Ptolemaic theory of education as embodied in the dictum of Pope, "The proper study of mankind is man," and to accept more and more readily the Copernican theory, that the microcosm man, with his histories, languages, and literatures, is, after all, only part of a larger universe. This consideration, together with the fact that in the curriculum of a school of this type utilitarian aims must, from social necessity, preponderate, leads to the conclusion that such practical subjects as mathematics, physics, chemistry (or hygiene, botany, or physiology in girls' schools), geometrical drawing, and manual and physical training, should claim a considerable share of the school time—say 14 out of a total of $27\frac{1}{2}$ hours. This would leave $13\frac{1}{2}$ hours for moral,

civic, literary, and æsthetic subjects. These would comprise English subjects (grammar, composition, literature, history, and geography), two modern languages (or Latin and one modern language), art, and music.

In working according to such a curriculum two principles should, in my opinion, be borne in mind:

(1) It is important that the pupil should be trained in self-reliance and personal initiative—in other words, that the active and inventive, rather than the passive and receptive, side of the pupil's nature should be cultivated. Personally, I am convinced by experience that a judicious use of heuristic methods of teaching in all subjects is the best way to achieve this end.

(2) The subjects should not be treated as though they were enclosed in water-tight compartments, but should be correlated and made mutually helpful.

The first principle may be illustrated in the case of a few subjects. In science, e.g., according to this method, text-books would be entirely dispensed with for the first two or three years. Each year's course might consist of several definite lines of investigation, each comprising a series of graduated experiments arranged in such a sequence that any given experiment can be performed by a common-sense application of the results from previous experiments.

Art teaching in schools has largely consisted hitherto of servile copying of conventional ornament in the flat. While a certain amount of such drawing is necessary in the preliminary stages, in order to give executive skill and a knowledge of balance, symmetry, and proportion, the drawing from natural objects, especially from plant and floral forms, has the obvious advantage of training the observation, of taking the pupil to the original source from which conventional ornament has been derived, and of furnishing material for employment in original designs. These should be executed in colours, since appreciation of colour harmonies and contrasts is surely as important as that of beauty and grace of form.

In studying the grammar of a foreign language, also, the method of active investigation rather than that of passive receptivity would for similar reasons be employed. The conversational sentences used in the earlier lessons would furnish the data from which, by induction and comparison, the elements of grammar might be derived by the pupils under the guidance of the teacher. In the subsequent stages, the reading of continuous narrative in the language would furnish material for more advanced work in grammar. The definite aim in teaching a language should be to give the power to converse in the language and to appreciate its literature.

The second principle, correlation, has of late years been preached *ad nauseam* by its devotees, until some people are inclined to regard it with scepticism. Judiciously used, however, it becomes a valuable means of economising time and energy, and of eradicating the youthful tendency mentally to isolate closely-allied subjects, which are taught in different class-rooms and by different teachers. Thus arithmetic, algebra, and geometry are not ends in themselves, but intellectual tools to be used in the investigation of other fields of knowledge. For this reason it is highly desirable that the teacher of arithmetic should show the practical application of his subject by giving problems on areas, volumes, densities, specific gravities, &c., and chemical problems, such as percentage compositions. The application of arithmetic to the workshop may be illustrated by problems such as the following: "Find the length of plank required to make a box 12 in. by 4 in. by 3 in., the thickness of the wood being $\frac{1}{8}$ in." Similarly, the formulae used in experimental physics should be intro-

duced into the algebra lessons. The principles of geometry find frequent applications in the physical laboratory, and are of the greatest importance in the manual training room (especially in metal work), not only in preparing the working drawings, but in applying the properties of the circle and the method of developing curved surfaces.

In conclusion, permit me to refer to two important subjects which are entirely omitted from the school curriculum, or admitted with unsympathetic toleration, viz., manual training and civic instruction.

Manual training is not intended, as is sometimes thought, to turn out "rude mechanicals." Dexterity and accuracy in the use of hand and eye are not only indispensable to the carpenter and blacksmith, but to the surgeon, the artist, the sculptor, the musician, the inventor, and the scientific experimentalist. As our pupils are all possible workers in these fruitful fields of human activity, in which delicate manipulation is the prime essential, any system of education which fails to give a general training of hand and eye is a very incomplete and one-sided education.

Herbert Spencer pointed out in his work on "Education" that if our school books were unearthed by some future antiquarian, he would conclude that these were the text-books of some monastic order, since instruction in the duties of parenthood was entirely omitted.

Might it not with even greater force be urged that our present system is too exclusively directed to the personal advancement of the pupil on leaving school, and that we are apt to forget he will be not only a bread-winner or a wealth-seeker, but also a citizen of the greatest empire of ancient or modern times? Yet instruction in the rights, duties, and responsibilities of the citizen receives but scant attention in schools wholly or partially supported by the State. The subject of civic instruction is intimately related to history on the one hand, and to ethical teaching on the other, for the conception of morality is surely a narrow one which does not include man's social relationships in his capacity of citizen.

HISTORY AND CURRENT EVENTS.

This year, the short-lived kingdom of Great Britain would have been two hundred years old. Our Scottish friends are thinking of celebrating the event, though some of them think that an event which, in their opinion, did not bring much good to Scotland, need not be remembered. The union which put an end to the kingdoms of England and Scotland was long planned and took long in completing. Roughly speaking, the periods are about a century each. The marriage of Margaret Tudor to James IV. may be taken as the beginning of things. The marriage schemes which were to precipitate matters in the middle of the sixteenth century were wrecked on the differences of race and religion. The claim of Mary Stuart to be the one sovereign of the two kingdoms was premature. But when the miraculously preserved life of Elizabeth Tudor at last ended in 1603, Mary Stuart's claim was recognised in the person of her son, James VI., and, owing partly to Cecil's management, the accession of the Stuarts to the English throne was quietly consummated.

But the union of the kingdoms was not thus achieved. James was King of England, Scotland, and Ireland, but the three kingdoms were separate, having each its own Parliament and other local machinery, united only in the person of the sovereign. James himself would have liked to unite England and Scotland still further; and his

flatterers, like Lord Bacon (see his *Essay on Prophecies*) and the Translators of the Bible (see their Preface), called him King of Great Britain. But, except in international politics, the kingdoms remained separate, and Charles I. even used the distinction to urge the Short Parliament to oppose the Scots, as a foreign, invasion. Oliver Cromwell was, like Edward I., temporarily a successful Unionist, and his Protectorate Parliaments contained representatives from the three countries. The Restoration separated the kingdoms again, and it was not until 1707, after many unfriendly discussions, that the kingdoms of England and Scotland united, i.e., ceased to be, to form the Kingdom of Great Britain. That kingdom did not last a century. Why?

BUT this year is also the tercentenary of the birth of Greater Britain. "In the year 1614, a certain Richard Martin was solemnly rebuked by the Speaker for daring to tell the House of Commons to its face that the struggling fortunes of Virginia were of more weight than all the 'trifles' which usually occupied their attention." Seven years previously, while Raleigh was in the Tower, another, and this time a finally successful, attempt had been made to found an English colony on the shores of North America, and the folk of Jamestown are naturally planning, in association with English friends, to celebrate the occasion. What "Virginia" meant then, and how many colonies were founded there in the seventeenth century, from how many different motives, and in what various ways, would be a suitable subject for lessons this year for our pupils. How that early colonial empire passed away from us, and how the nineteenth century saw the growth of another, is getting now to be common knowledge. Whether George Washington may be regarded as the expander or the diminisher of the British Empire may well be the subject of school essays.

THE German Emperor and his Chancellor are congratulating themselves on the results of the recent elections to the Reichstag. They appealed from the old Reichstag to the German nation, and they have triumphed. There are so many groups of politicians in that country, and the constituencies are so curiously arranged, that it is difficult to explain clearly the meaning of all the phenomena, but the whole episode reminds us of our own eighteenth century, when the House of Commons was far more under the influence of the Crown and the House of Lords than it is at present. The German Chancellor is the Emperor's Minister, as Walpole was of George I. and George II. The loyalty of the people to the throne is greater than to any of the parties, and as Bismarck and Walpole could, by adapting themselves to currents of opinion, remain in office, so Prince Bülow does not think of resigning. We are reminded, too, of "Fox's martyrs" in 1784, when George III. appealed to the country against the Whigs in favour of the younger Pitt, and obtained a final victory over "connections."

Classic Tales. By C. S. Fearenside. 497 pp. (Bell.) 2s. net.—This volume, as an addition to the "York" Library, is a rearrangement of a volume which had previously appeared in Bohn. Walpole's "Castle of Otranto" replaces "Gulliver's Travels." Mr. Fearenside's introductory matter is well done; especially happy is the idea of the chronological table which precedes it, and the "helps" at the end of it are capital. As a book, either for a leisure hour, or a volume for the student of literature and humanity, this has both value and charm.

ITEMS OF INTEREST.

GENERAL.

THE appointment of Dr. Macnamara, M.P., to be Parliamentary Secretary to the Local Government Board has given much satisfaction to the teaching profession. Dr. Macnamara was certificated as an elementary-school master twenty-five years ago, and has been the editor of the *Schoolmaster* for the last fifteen years. He has long been acknowledged as an expert in educational affairs, and his first-hand and intimate knowledge of the work of schools, together with his thorough belief in the value of education, have ensured for him the respect and consideration of the House of Commons. We wish him the success which his great abilities and earnestness deserve.

AT the London County Council conference held in January, 1906, the suggestion was put forward that teachers of history had long felt the need for some organisation to promote the study of that subject in schools and to facilitate co-operation amongst those engaged in teaching it. The suggestion at once bore fruit, and by the end of June, 1906, an Historical Association had been formed, the aims of which are: (i) The collection of information as to existing systems of historical teaching at home and abroad; (ii) the distribution of information amongst the members of the association as to methods of teaching and aids to teaching; (iii) the encouragement of local centres for the discussion of questions relative to the study and the teaching of history; (iv) representation of the needs and interests of the study of history and of the opinion of its teachers to governing bodies, governmental departments, and other authorities having control over education; (v) co-operation for common objects with the Geographical Association and others. Since June, 1906, the work of the association has gone steadily ahead. The membership numbers more than 500, and local branches have already been started in university and other centres. The first annual meeting was held at University College on February 8th and 9th. Mr. Bryce delivered an address on the "Teaching of History." A paper was read by Prof. Tout maintaining "that the study of broad outlines rather than that of limited periods should be the foundation of historical teaching in schools." All persons are eligible for membership of the association who are engaged or interested in the teaching of history, and applications should be made to the secretary, Miss M. B. Curran, 6, South Square, Gray's Inn, London, W.C.

THE Federated Associations of London Non-primary Teachers have arranged to hold a conference on the teaching of history in schools on March 9th at 3.30 p.m. The meeting will be held at the Regent Street Polytechnic, London, and papers will be read by Miss Alice Gardner, Newnham College, Cambridge, and Dr. J. E. Morris, Bedford Grammar School. A discussion will follow the papers, and all teachers interested in the teaching of history are invited to attend.

THE prizes gained in the twenty-second annual competition held among English schools by the National Society of French Masters in England were distributed by the Lady Mayoress at the Mansion House on February 2nd. The Sèvres vases given by the President of the French Republic were awarded to the City of London School for Girls and to Charterhouse. The gold medals given by the Minister of Public Instruction were awarded to Miss L. Goodfellow, Blackheath High School, and Mr. A. G. Evans, Cheltenham College. The silver medals given by L'Alliance Française were won by Miss Z. L. Hocart,

Ladies' College, Guernsey, and Mr. W. T. Mackie, Charterhouse. M. Cambon, speaking in French, said the competitions in French have had during the past year an extraordinary development. The number of the competitors has risen to nearly 4,000—a figure which has never been reached before. This indicates that the taste for the French language is growing more and more in England. The same is true of the English language in France, which forms one of the most important branches of instruction in French universities. M. Cambon said he sees in this a palpable proof of the *rapprochement* between the two nations and of the sympathy which it brings in its train, which is an effect of the *entente cordiale* established under the auspices of King Edward VII. and the President of the Republic.

A SCHEME for mutual aid in nature-study between town and country schools is proposed on the following lines. The Hon. M. Cordelia Leigh, 32, Chester Street, S.W., is the honorary secretary of the organisation. It is suggested that each country school included in the scheme shall send parcels of objects suitable for nature-study to some particular town school, the objects having been previously used for a lesson in the country school. Parcels should be posted once in three weeks from November to March, and once a fortnight from April to the end of October. The average postage of each parcel should not exceed 4d. Objects should be named as far as possible. The objects sent should include, for example, common wild flowers, with their leaves, in sufficient quantity to provide each child of a class with one specimen of the same flower; hedge-row growth, the same species in full leaf, flower, and berry; common grasses; and live animals which can be kept in confinement without cruelty, such as caterpillars, especially injurious ones, which the children may thus learn to know—e.g., larvae of the lackey moth, cabbage butterfly, woodborer, sawfly. The commonest objects are most suitable. No harmless creatures should be killed or rare plants uprooted for the purpose of sending. The honorary secretary will be glad to hear of town or country schools wishing to join. Applicants are asked to state whether the cost of postage would be provided for in their case.

AN interesting conference for women teachers in secondary schools was held at Hampstead from January 7th to 12th, 1907, to consider the subject of religious work in schools. The conference was convened by the Student Christian Movement and the Union of Students for Work among Schoolgirls. The total number of delegates attending the meetings was 187. Of these, 135 were teachers representing ninety-one schools, thirty-five were special guests and speakers, and seventeen were representatives of various societies definitely connected with Christian work either among schoolgirls or teachers. The meetings of the conference were presided over by Miss Douglas, headmistress of Godolphin School, Salisbury. The programme included Bible readings, addresses on missionary and social work, discussions on religious work for schoolgirls, and reports of what is being done in that direction and the teachers' ideals. The addresses at the evening meeting were of a more devotional character, and were given by the headmaster of Eton; Canon Walpole; Mr. J. L. Paton, Manchester Grammar School; Miss Douglas; Miss Maynard, Westfield College; and others. As this conference was the first of its kind ever held in England, its success may be partially measured by the fact that the proposal to hold another of a like nature in two years'

time was unanimously carried. One other practical outcome was the decision to form some sort of a teachers' union, which would be an expansion of the Union of Students for Work among Schoolgirls, under a new name and with a revised constitution. The names of five of the leading teachers present were added to the already existing committee. Particulars of further developments may be obtained from Miss Moinet, 74, Denison House, Westminster.

THE programme of the summer courses to be held at Jena from August 5th to 17th offers attractions to teachers and students of many subjects. There will be courses of lectures on various branches of natural and physical science, pedagogy, psychology and pedagogic pathology, sociology, theology, history, and philosophy, and conversation classes in German, French, and English. Copies of the programme, and other particulars, can be obtained from the secretary, Fräulein Clara Blomeyer, Jena, Gartenstrasse 4.

THE recently published report of the Departmental Committee on Education Rates contains an instructive table showing the principal sources, other than loans, from which local authorities obtained funds applicable to purposes of education other than elementary during the year 1904-5. The total sum reached to nearly two and a half million pounds, of which 20·6 per cent. was derived from grants from the Board of Education, 38·1 per cent. from Exchequer contributions, and 31·5 per cent. from rates. The remainder, nearly 10 per cent., represents fees and miscellaneous receipts.

ANOTHER summary in the report deals with the rates required for education other than elementary in 1905-6 by the councils of counties and county boroughs. Nineteen counties and seven county boroughs raised no such rate. Of the forty-three counties which levied the rate during the year mentioned, sixteen raised less than 1d. in the pound, nineteen as much as 1d. and less than 2d., seven (including the London County Council) as much as 2d. and less than 3d., and one county as much as 3d. and less than 4d. As regards the sixty-five county borough rates, in twelve cases the amount was less than 1d. in the pound, in thirty-four boroughs it was more than 1d. and less than 2d., in six more than 2d. and less than 3d., in nine more than 3d. and less than 4d., in three more than 4d. and less than 5d., and in West Ham the rate was more than 5d. in the pound.

THE recently published report—for the year ended March 31st, 1906—of the Medical Officer to the Education Committee of the London County Council merits the careful attention of all who are interested in questions of public health, and should appeal with special force to teachers and school managers. It gives encouraging evidence that the medical oversight of school children is bearing fruit in an improved standard of physical and mental efficiency, and can scarcely fail to impress every reader with the urgent necessity of extending such work, not only in London, but in all parts of the country. The report points out that a lack of hygienic ideas still prevails in some schools, and that a low standard in regard to lighting, ventilation, and furniture is still compatible with Government grants. A certain amount of antagonism—or at least indifference—to the work on the part of teachers is also revealed, but one is glad to find abundant evidence that, on the whole, the efforts of the medical staff are being warmly seconded by teachers and managers alike. One of the most striking features of the report is the

appalling ignorance of the most elementary rules of health which is shown to prevail among both children and parents. We read, for example, that among 1,000 children only two used a tooth-brush, although "a few older children take credit for using a tooth-brush on Sundays." It will be generally agreed that "the very great importance of the subject requires impressing on parents and children, both in school and evening classes."

THE recently published "class-lists" show that the total number of candidates entered for the Cambridge Local examinations held in December last was 13,777, exclusive of 2,155 candidates examined at colonial centres. In the senior examination, 933 boys and 1,227 girls passed, 84 boys and 21 girls being placed in the first class. Sufficient merit was shown by 397 boys and 115 girls to entitle them to exemption from one or both parts of the Previous examination. Of the junior candidates, 2,720 boys and 1,890 girls passed, the numbers placed in the first class being 335 and 61 respectively. In the preliminary examination, 1,718 boys and 1,324 girls satisfied the examiners.

WE have received the report for the session 1905-6 on the work of the Department of Technology of the City and Guilds of London Institute. The report points out that it is now fourteen years since the Institute first made arrangements for granting teachers' certificates in manual training to persons who had undergone an approved course of instruction in the subject, and who, during and at the close of their course, passed satisfactory examinations in practical work and in the methods of teaching. During these fourteen years the regulations for the award of teachers' certificates have been frequently modified, and the scope of the examinations has been enlarged, and persons other than certificated teachers in elementary schools have been admitted to the examinations. The certificates in woodwork and in metal work are accepted by the educational authorities of Great Britain and Ireland as evidence of the holder's ability to teach the subjects. Since the Institute established classes for the training of teachers in the use of wood-working and metal-working tools, instruction in this subject has made great advances and has been much improved. Originally introduced by way of experiment in a few elementary schools, it is now a recognised subject in the curriculum of many elementary and secondary schools, and also to some extent in training colleges.

THE subject of apprenticeship has received much attention during the past year in Switzerland, where four cantons—Basel, Lucerne, St. Gall, and Zurich—have passed Acts regulating the attendance of apprentices at evening schools. These Acts render attendance at both the evening schools and the final examination compulsory for all apprentices, male and female. Some relaxation is accorded if the pupils live a long way from the school, and exemption is, of course, granted to pupils at higher schools, whether technical or commercial. In the first year or two the cantonal governments have promised not to administer the Act harshly, and some employers are inclined to sail as near the wind as possible. Trade competition is assigned as the cause in a number of cases; but the apprentices are still inclined to look on the evening classes as a curtailment of their freedom. In Canton Zurich, the employer has to give four hours per week from office time to enable the apprentice to attend classes. The apprentice will also have to make some sacrifice of his spare time if he wishes to complete the course with credit. At present

there are about 5,200 persons affected by the Act, and it is expected that 1,500 will ultimately have to attend the annual examination at the end of their articles. On passing this examination the pupil will receive an official certificate, on which his record is inscribed.

PART of the machinery for administering the Acts has existed for some years, owing to the public spirit of the Society of Swiss Merchants and the Mechanics' Union. These bodies have hitherto formed classes for the instruction of apprentices, and have held examinations. These classes and examinations will continue, and the societies will receive recognition for their efforts. Where no branch of either society exists, the local authorities will be expected to form a continuation school. Though attendance at evening schools is compulsory in several cantons, it is not intended as yet to make attendance at these schools for apprentices compulsory for others than those serving articles, if no Act compelling attendance at continuation school exists. On the other hand, in cantons where attendance is compulsory, the commercial or the mechanics' school is recognised as exempting from attendance at the more elementary evening school. As a rule, an apprentice will have to attend classes for three years before he can present himself for examination. These years will be those including his sixteenth, seventeenth, and eighteenth birthdays. In this way he will be gradually released from discipline, and gradually introduced to the duties of a citizen.

THE fifth issue of "The Schoolmasters' Yearbook and Directory," that for 1907 (Swan Sonnenschein, 6s. net), not only maintains its high level of excellence, but shows that the editor intends year by year to increase the usefulness of the indispensable work of reference under his care. Educational administrators, writers on educational subjects, and those actively engaged in the schools have learnt to regard the Yearbook as a trustworthy companion, and unless our experience is uncommon, they always have the well-arranged volume at hand.

THE "Public Schools Year Book" for 1907 (Swan Sonnenschein, 3s. 6d. net) is the eighteenth issue of this useful work of reference. In addition to an exhaustive description of each public school included, the editors provide a series of chapters, instructive alike to parents and schoolmasters, on public examinations, how to enter the various professions, on preparatory schools, and other subjects. Judging from the frequency with which we ourselves consult the "Year Book," we can recommend it to all workers in the field of secondary education.

WE have received a copy of *The Federal Magazine*, which is a development of the *Monthly Record*, the official organ of the League of the Empire. One of its principal features is to be a series of articles on educational subjects by authorities in different countries and Crown colonies. Monthly reports will also be published in connection with the Federal Conference on Education, to take place in May next.

SCOTTISH.

THE Scottish Educational Reform Association, which was formed some time ago, has wakened to fresh life with the approach of a new parliamentary session. The association confines itself to advocating three general objects: (i) The creation of large areas in which elementary and secondary education shall be administered locally by the same authority. (ii) The establishment of a representative national council to be consulted by the Scotch Education Department in matters of administrative policy. (iii) The enlistment of the co-operation of the universities and other

institutions for higher education in developing and guiding the school education of the country. While supporting these general lines of reform, the association wisely leaves the question of details alone. The association will take no part in parliamentary elections, but will seek to make its influence felt by propagandist work through publications and meetings.

A PUBLIC meeting under the auspices of the association was held in Glasgow University. Mr. Haldane, who has occupied the position of president since the formation of the association, said that it was with much regret he found himself unable any longer to act as president. As a member of the Cabinet before whom questions affecting education in Scotland would have to come, he felt it his duty, both to his colleague, the Secretary for Scotland, and to the association, to demit office. This does not mean, in the least, that his interest in Scottish education will be less keen or less complete than it has been before. He is becoming more and more convinced that the education of this, as of every other country, depends in great measure on the character and training of the teachers. He is glad to find that, as a result of the new regulations for the training of teachers, the ties between the universities and the teaching profession have been greatly strengthened. Mr. Haldane, in supporting the nomination of Mr. C. M. Douglas as the new president, said that no man in Scotland had worked harder than Mr. Douglas in the cause of education, and none had it more genuinely or more thoroughly at heart. Mr. Douglas's nomination was received with acclamation; and Mr. Lamont, M.P., and Principal Laurie, were appointed secretaries.

THE question of university reform has been more or less a matter of public discussion for the past few years. Both from within and from without the universities the cry has arisen for a radical alteration in the government, curriculum, and methods of these bodies. It is only the barest justice, however, to admit that the most pointed and fruitful criticism of the present position has come from the professors themselves. These are so often charged with being educational obscurantists that it is pleasing to find them here in the van of progress. But the agitation for reform has hitherto suffered somewhat from lack of concentration. The fire of criticism has been strong and well directed, but too intermittent to arouse public attention, and after each volley things have gone on pretty much as before. The Committee of the Carnegie Trust seems likely to achieve what individual effort has so far failed to accomplish. In a lengthy document the Committee passes under review the leading features in the existing arrangements, and subjects them to a merciless criticism. The preliminary examination, the nature and scope of the curriculum, the length of the session, are all weighed up and found wanting. The whole document constitutes an unanswerable plea for prompt and thorough-going action if university education is to be placed upon a satisfactory basis. The country has been thoroughly aroused by this carefully reasoned and elaborate indictment, and a University Commission may confidently be looked for during the present session.

THE Scotch Education Department has just issued a circular detailing the conditions for recognition as qualified teachers of modern languages. Candidates must have attended an approved course at training college or university classes or at special courses extending to not less than sixty hours, and recognised by the Provincial Committees as qualifying for that purpose. The examination will

consist of three parts: (i) The Preliminary Oral Test, which must be passed at least one year before presentation at the final examination. (ii) The Written Examination, which will be held immediately before the Easter recess. The papers will be similar to those set for the higher-grade leaving certificate, but the standard required for a pass will be considerably higher. (iii) The Oral Test. This will be conducted during the summer session following the written examinations. A high standard will be exacted as regards accuracy of pronunciation and fluency of utterance, as well as capability of understanding ordinary conversation or simple narrative.

THE General Committee of Management of the Educational Institute of Scotland has had under consideration the proposal to alter the date of the leaving certificate examination. While recognising the importance of the reasons given by the Department for the proposed change, it recommends the retention of the present date on the following grounds: As the leaving certificate examination is the objective of the year's work, the present date maintains the interest and the attendance of the pupils until the end of the session. Theoretically, an examination should be merely an incident in a progressive course, but it is felt that many would consider the examination and the end of the session as co-terminous. The general effect, therefore, of the change would be to reduce the school life of many pupils by three months. It is further pointed out that Easter is a time when pupils are least fit, physically, to meet the demands of such examinations.

THE annual meeting of the Sloyd Association of Scotland was held in the E.C. Training College, Edinburgh. Dr. Morgan, president, in the chair. The secretary's report showed that twenty-five candidates sat for the examination for the higher certificate of the association, and sixteen for the lower. Of these, eight obtained higher certificates and fourteen lower. These certificates are recognised by the Scotch Education Department and by local education authorities as qualifying for giving instruction in the subject. Mr. Scougal, senior chief inspector of schools, congratulated the association on the admirable work it is doing. Educational handwork is now a recognised part of every well-balanced curriculum, but the public has still to be educated to see that its value and importance lay more on its educational side than on its manual side. When this is fully recognised no more will be heard in depreciation of the subject on the ground that it is playing at "joiner's work."

IT is officially announced that Dr. Donald Macalister, director of medical studies at St. John's College, Cambridge, and president of the General Medical Council, has been appointed principal of Glasgow University in succession to the late Dr. Story. Dr. Macalister, in an age of specialists, is essentially an all-round man. He was senior wrangler and first Smith's prizeman in 1877, is a Master of Arts, a Doctor of Medicine, a Bachelor of Science, a Doctor of Laws, and a distinguished geographer. His appointment as successor to Sir William Turner proves that he is also a man of affairs, and that is of the utmost importance at the present time, when the need for reorganisation in all departments of university life is universally recognised.

IT is not often the retiral of a schoolmaster, however eminent, attracts much public notice, yet circumstances have combined to make the retiral of Mr. Butter, for thirty years headmaster of Meigle Public School, a notable one. Meigle is a small village in Perthshire, and known to fame chiefly by reason of its nearness to Belmont

Castle, the home of Sir Henry Campbell-Bannerman. A gathering representative of all classes of the community assembled the other day to show their appreciation of Mr. Butter's work and worth, and to present him with some tangible tokens of their esteem. Among the apologies for absence was one from the Prime Minister, who said he would have liked to show by his presence, and perhaps by a word or two, his sincere admiration of Mr. Butter, his regret at his retirement, and his deep sense of what the community of Meigle owed to him. "No better example could be found of the Scottish schoolmaster, a type which had done more to make the Scottish people what they were than minister, laird, or factor. The dominie was the man for a' that." Such a tribute reflects honour on every member of the teaching profession, and Mr. Butter, the *fons et origo* of it all, well deserves the admiration and respect of all his professional brethren. In view of all this it seems the veriest mockery that such a man should be rewarded by a pension of about £40 a year. "Mouth honour, breath," Scottish teachers have always had in plenty. They are surfeited with it, indeed, and would commend to all their admirers the advice of the cow to its owner, the piper: "Gae me a peck o' oaten strae and sell your wind for siller."

IRISH.

In addition to the Government pamphlet with the Rules and Programme of the Intermediate Board for 1908, the Intermediate Commissioners have now issued their own usual book (price 3d.), containing, besides the matter we mentioned last month, the notices ordinarily prefixed to the Rules detailing the important changes made and giving the official calendar. It is explained that by the subject of language, literature, and history of Great Britain and Ireland is meant merely English composition, and that questions on the subject-matter set will be discontinued. The announcement is also made that the Intermediate Board has been added by the Lords Commissioners of the Admiralty to the list of authorities who are allowed to nominate candidates for entry into the Royal Navy as boy artificers. Candidates are entered twice a year, in January and in August, and must be between the ages of fifteen and sixteen. The number of nominations is very limited, and applications must be forwarded to the Assistant Commissioners before November 15th for entry in January, and before May 15th for entry in August.

A WHITE paper was issued last month (price 2½d.) containing the correspondence that passed between the Government and the Intermediate Commissioners on the subject of the resolution of the House of Commons of May 21st last, the chief point of which was that Irish should be put upon an equality with all languages other than English in the programme for 1907. The correspondence is somewhat acrimonious, the Government actually threatening to dismiss the Commissioners, who replied with a dignified protest. The point at issue was this: the Commissioners said that the changes demanded could not be made in time in the 1907 programme, as to put Irish on an equality with Latin, French, and so on, would require a complete change in the Rules. Either the Board must insist on two languages besides English, and this would be a hardship on students in the higher grades who had already passed through the lower grades with only one language, or else if only one language were compulsory, then students from bilingual districts would by means of Irish be able to pass through an intermediate course without receiving an inter-

mediate education by taking, say, English, Irish, arithmetic, geometry, book-keeping, and shorthand, a course inferior to that of primary schools. The Commissioners further urged that, as the Lord Lieutenant had signed the Rules, the Government should in the House of Commons have defended the Board. The Government took up the position that the Board was unconstitutionally trying to defy the House of Commons, and weakly maintained that when the Rules were officially sanctioned the Lord Lieutenant was not aware of the position accorded to Irish. The quarrel ended in the Rules for 1906 being continued for 1907, while the Rules for 1908 contain the changes desired by the House of Commons, but whether in a form desired by intermediate schools is another question.

THE official meeting of the Irish National Party, held in Dublin just before the opening of Parliament, passed two educational resolutions: (1) That Irish education in all its branches—primary, intermediate, and university—is in a condition of deplorable neglect and disorganisation, approaching to chaos. That we warmly sympathise with and pledge our support to the great popular movement recently started in favour of the reorganisation of primary education, and the removal of the intolerable grievances of the Irish national teachers. (2) That the Irish Parliamentary Party be strongly exhorted to take immediate and energetic steps to have the intermediate grants to schools and awards to students restored to the standard of 1903, and that the alleged reason for the sweeping reduction is discreditable to any Government. It is to be hoped that the new Chief Secretary will at once take educational matters in hand and try to reduce some order out of the chaos into which things seem to be drifting.

THE Department of Agriculture and Technical Instruction has issued several circulars of importance to education. Summer courses of instruction for teachers will be held next summer, from July 9th to August 2nd, in experimental science, in laboratory arts, in drawing and modelling, in domestic economy, in manual training (wood-work), in crochet work, embroidery, sprigging, and drawn thread work. A course will be held from August 6th to 31st for manual instructors in metal work, wood-carving, turnery, and building construction. Teachers desiring to take advantage of these courses must apply before March 30th. There will be awarded in December, 1907, ten open scholarships and ten limited scholarships to assist domestic economy students in taking the full course of instruction at the Irish Training School of Domestic Economy. The examination will take place for candidates (who must be between nineteen and thirty years of age) on December 3rd. Full particulars must be applied for between June 1st and September 30th. Three teacherships in training, tenable at the Metropolitan School of Art, Dublin, will be competed for on July 2nd to 4th. The examination will be in art subjects, and application must be made before April 30th. The Department further announces that a limited number of scholarships of the value of £50 per annum, tenable at the Royal College of Science for three years, and of teacherships in training with an allowance of 21s. a week for the session of forty weeks, will be competed for on July 2nd to 4th. Application must be made before April 30th. The competition is confined to mathematics, experimental science, and drawing, and candidates must be between sixteen and thirty years of age. A special examination for teachers' qualifications in manual training (woodwork) will be held in Dublin on June 25th and 26th. Applicants must be twenty-one years of age, and send in their names before May 1st.

MR. BRYCE before his departure launched on Ireland a last Parthian shot with his scheme for settling the Irish university question. He candidly admits that the Government had made up its mind to its plan without regard to the Royal Commission on Trinity College. The report of the latter was barely published, and the evidence on which the report is based was not published, when Mr. Bryce enunciated his views to two deputations specially invited for this purpose. He claims, however, that the recommendations of the majority of the Commissioners are in favour of his proposal. It is doubtful whether this is really the case, for although both proposals agree in suggesting a second college in Dublin suitable for Roman Catholics, with others in Cork and Belfast, to be incorporated alongside of Trinity College in Dublin University, the nature and functions of the university proposed seem to differ greatly. The Commissioners suggest a university in which the colleges will be practically autonomous, the interference of the University being reduced to a minimum, while the Government scheme involves a great deal of interference with the colleges on the part of the University. Briefly, Mr. Bryce outlines a scheme similar to Mr. Gladstone's of 1873. The Royal University is to be abolished, and the Queen's Colleges, with a new Roman Catholic college, are to be incorporated in Dublin University. It is hoped that this college will, for scientific purposes, be able to avail itself of the new Royal College of Science. The University would be governed by a body partly nominated by the Crown and partly elected by the University teachers and the whole body of graduates. It would also appoint teachers in non-controversial subjects. In controversial subjects alternative papers are to be set, and the professors are not to be allowed to teach views which would give any offence.

THE attitude of the Nationalist Party to this scheme is undecided. While praising Mr. Bryce for his courage in enunciating a definite proposal, it prefers to await details before giving a final approval. Trinity College has repudiated it with spontaneous unanimity. It has made its position quite clear. It has no objection to the endowment of a Catholic University College, but it objects to being federated with it. At a very large meeting of the Senate on February 4th the following resolution, proposed by the Provost, was unanimously carried: That we are of opinion that the scheme which Mr. Bryce outlined in his speech of January 25th would be fatal to the best interests of liberal university education in Ireland, as well as unjust to Trinity College, and we are determined to oppose it by every means in our power.

WELSH.

A DISTINCT Department of Education is created at Whitehall to deal with all grades of education in Wales and Monmouthshire. The first step has been taken, by the appointment of a permanent secretary of the Welsh Education Department and a chief inspector for Welsh education. These officers will be directly responsible to the President of the Board of Education. The work of separating the details in the Board of Education which refers to Wales and transferring them to the new department is going on, and it is expected that the separation will be effected so that the new Welsh department may be set in motion at the beginning of April. Some functions of the new department will still be dealt with by South Kensington, pending the concentration of all branches of the Board's work in the new premises next Christmas.

THE first permanent secretary is Mr. A. T. Davies, who was educated at the University College of Wales, Aberystwyth, of which college he is a governor. By profession he is a solicitor. He is a member of the Education Committee of the Denbighshire County Council, and has done organising work in the promotion of technical instruction in Lancashire. The first chief inspector is Mr. O. M. Edwards, who was educated at the Bela Grammar School, at the University College of Wales, Aberystwyth, and at Balliol College, Oxford. He was elected M.P. for Merionethshire, to succeed the late Mr. Thomas Ellis, but only remained in Parliament a short time. He is a Fellow and Lecturer on Modern History in Lincoln College, Oxford. He is a well-known authority on the history of Wales, and has worked with marvellous energy in writing for and editing Welsh magazines, and is closely identified with Welsh educational and literary movements. He has been Warden of the Guild of Graduates of the University of Wales. The two officers on whose guidance the success of the new devolution will so greatly depend are recognised as capable men and thoroughly acceptable to Wales.

THE newspapers speak of the new Welsh department as having relations with all grades of Welsh education. But it is not definitely announced, for instance, that the Welsh department will have any direct relation with the University of Wales. Nor is it specified as to how it will control intermediate education. The questions arise: Will the Government proceed with the idea of an Education Council for Wales? What is to be the position of the present Central Welsh Intermediate Education Board? And—a matter of great interest to elementary-school teachers—will there be a separate Welsh code promulgated?

THERE is great uneasiness at Cardiff over the compulsory Welsh question. Welsh is now being taught in the elementary schools in accordance with a resolution of the City Council, passed by the narrowest majority. But the opponents have brought up the question again. The chairman of the Education Committee was not present, and it was, on that account, decided to adjourn the discussion. How long the present indecision will last remains to be seen, but in the meantime it would appear that, in spite of the attempt to require the teaching of Welsh in the Welsh county schools, the Cardiff City Council cannot even make up its mind to discuss the question at present with regard to its own intermediate school.

A SERIOUS difficulty has arisen in connection with the Gelligaer Intermediate School (Glamorganshire). The clerk of the school has had to write, on behalf of the governors, to the Glamorganshire Education Committee, to say that the financial position of the Gelligaer school is very serious, and to ask if the County Education Committee can see its way to make an advance to the school to meet accounts due. It is pointed out that unless those accounts are met the creditors will probably take legal proceedings to recover them. The clerk to the Glamorganshire County Council has replied that there is nothing due from the county education authority, and if the creditors take proceedings they will be against the governors personally, as the county cannot assume any responsibility for the debts incurred.

THE Glamorganshire Education Committee has in the past advised the Gelligaer Committee to raise the fees to cover the working cost of the education to scholars coming from the adjacent county of Monmouth. These

were fixed at £12 for boys and £10 for girls. The Monmouthshire County Council agreed at once to pay them. But the Gelligaer governors refused to raise the fees to children in their own district, asserting that £4 a year was as much as could be afforded by their own *clientèle*, since many parents had also to pay train fares as well for their children. The county authority stood out for the raising of the fees to £5 a year, and advised a reduction of the number of scholarships. The governors have decided to seek an interview with the President of the Board of Education to lay the whole question before him.

RECENT SCHOOL BOOKS AND APPARATUS.

Classics.

A First Greek Course. By Dr. W. H. D. Rouse. vi+172 pp. (Blackie.) 2s. 6d.—This book, Dr. Rouse tells us, is compiled as part of a reformed school curriculum. The idea is that a boy well graduated in French and Latin shall begin Greek between fourteen and fifteen; with three-quarters of an hour a day he will make rapid progress, and in less than a year be able to read the "Apology" of Socrates. There is no doubt about the soundness of the idea. The present writer began Greek between thirteen and fourteen, and was reading the "Hecuba" in less than three months and the "Apology" well inside a year. It is essential, however, to have the foundation of French and Latin well laid. In this book we have writing, construing, and conversation carried on together from the beginning; pieces of genuine Greek literature accompany the grammar, even the alphabet; these are to be read, written about, and talked over in the original. The book is therefore fresh and stimulating. Dr. Rouse arranges the grammar in his own order, and accompanies every exercise with its own vocabulary, but a compendium of ordered grammar with a verb-list and alphabetical vocabularies takes up the latter half of the book. For criticism: the infinitives on p. 5 should be translated; the rule (p. 10) for the lengthening of *o* in the comparative is inaccurate for words like πικρός or πικνός; the rule (p. 19) about verbs with a strong aorist is too general—e.g., it would not apply to θῆναι or τρέπειν; the acc. is only used of motion to in poetry (p. 23); the accent of the dual of contracted adjs. nom., m. and n., is oxytone, not circumflex; σσ occurs sometimes for ττ—e.g., in πράσσω (p. 67) and ἐλάσσω (p. 107); there is considerable confusion on p. 67; we are sorry to see ἀνάγεων and λελύκω, λελύκουμι, &c. (instead of λελυκώς ό, είην). We do not think λύω, with its puzzling changes of quantity, a good verb to be used as a paradigm, but in any case Dr. Rouse has omitted to distinguish the voices on pp. 116–8. He is inaccurate in the neuters of ἄστρος, θεβάς, on p. 142.

First Latin Book. By W. H. S. Jones. 100 pp. (Macmillan.) 1s. 6d.—Mr. Jones gives us in this another book on the oral method of teaching Latin. It is intended for beginners of about twelve years of age, and covers the first year's work. Those who are adopting this method will be grateful for this book, but it is essential, as Mr. Jones says, that the teacher should have spontaneity. There is no translation into Latin, but there are exercises, oral and written, in free Latin composition, based on the Latin passages given. We are sorry that these are not throughout based upon actual extracts from Latin literature. Some of the pieces to be learnt by heart are poor stuff. The grammar begins with the imperative and pres. indic.;

then we have *parvus, quis, sum, &c.*; but it is all properly rearranged at the end of the book in logical order. It is not clear why the verb in the paradigms is changed sometimes, and occasionally more detail is wanted; e.g., the imperative of *facio* should be added on p. 5, unless *capio* be substituted, and the pres. inf. pass. is dismissed too curtly. On p. 3 the answer *surgit* is incorrect. It would be impossible for the beginner with the information given to form correctly the ppf. of *sto* (p. 38) on the p.p.p. of *dico* (p. 52). The ingenious tables on pp. 40 and 41 are unnecessary; grammatical drill requires unsterotyped variety; and on p. 41 fourth conjugation should be fourth declension. Stress is rightly laid on pronunciation, but nothing is said about the division of syllables; e.g., in § 5 the words should be divided, *pos-se, lam-mi-na, va-cā*.

Geography.

The Preliminary Geography. By Dr. A. J. Herbertson. viii+149 pp. (Clarendon Press.) 1s. 6d.—This is vol. i. of the Oxford Geographies, vol. ii. of which has already reached a second edition. The series is educative to a high degree, and throughout the "Why?" and the "Wherefore?" are insisted upon. The reader is everywhere encouraged to think, nay, made to think, on the dependence of Man upon his surroundings. In this preliminary volume the style is largely descriptive, and rightly so. The author's idea is to give definite "pictures" of the different parts of the world. To this end quotations of, and condensations from, travellers' stories are freely laid under contribution, and always with effect. Nevertheless, the main defect is, we think, that the book is rather hard throughout, and we thought the same of vol. ii.; the author himself seems to have felt this, as here and there he has marked portions which may be omitted "on a first reading." Certainly to read the book in class requires a teacher who shall be considerably more than a "chapter-ahead" man. Given such a teacher, and all is plain sailing. Two features we like especially: everything is referred back to causes and principles, and maps are, as a rule (not always—more's the pity!), fully explained. By way of examples, the chapter on climate in N. and S. America introduces explanations of land and sea breezes, wind influences, forms of water, fog and cloud, cause of rain, &c.; under Fig. 39 (a map of Asiatic highlands and lowlands) is printed: "Notice how the land below 600 feet is mainly in the west and north-west, where it is continuous with the lowlands of Europe. It is also found in patches round the margins. Come back to this figure and notice more particularly the lowland of China, India, and Mesopotamia when studying Figs. 41, 48, and 49." This is as it should be; we wish there was more of it.

Atlas of the World's Commerce. By J. G. Bartholomew. (Newnes.) To be completed in twenty-two parts, 6d. each.—This publication continues to progress along the same excellent lines as in the earlier portions. To teachers of commercial geography it should be almost a *sine qua non*. Part 12 deals with cocoa and spices, beer and spirits, barley, millet, sago, rice, and rye; Part 13 with flax, hemp and jute, precious stones and pearls, and petroleum; Part 14 with various climatic and population conditions, the languages of commerce, the wealth of nations, and the commercial development of the world. Succeeding parts commence a gazetteer of countries and ports, and deal with such subjects as dairy produce and the meat trade, fruit and timber, coal and other minerals. By the end of January Part 19 had been reached. We have not space to enumerate the many striking points, all of which are

well indicated; the following will serve as examples: the remarkable increase of rice production in the southern States (by some attributed to Japanese immigration); the greater consumption per head of beer in the United Kingdom than in Germany, where the preference for wine in the south lowers the "beer" average; the overwhelming preponderance of S. Africa in the diamond trade; and the crowding of population up the Ganges valley in India. Part 12 begins one of Mr. Chisholm's characteristic and excellent dissertations on "Economic Geography." He is at pains—and not before time—to point out that the field of study has limits. Some latter-day authors, teachers, and lecturers have appeared not to realise that geology and political economy and economic statistics are in themselves not geographical facts at all, but merely influences producing certain geographical results, and as such should be kept in their proper positions in geographical treatises. Mr. Chisholm shows how this may be done, as he enumerates and descants upon the permanent geographical conditions which make for economic development; and he does it all excellently.

Geographical Gleanings. By the Rev. Frank R. Burrows. 75 pp. (Philip.) 1s. 6d. net.—We commend this booklet to those teachers of geography—unfortunately a large number—who do not realise the educational value of their subject. Mr. Burrows has little to say that is new to readers of modern educational literature, but his thorough belief in geography as an educative agent makes all he has to say interesting and helpful.

Mathematics.

Geometry, Theoretical and Practical. Section iv. Rectangles and Polygons. By W. P. Workman and A. G. Cracknell. 330-418 pp. (Clive.) 1s.—Part i. of this manual is noticed in THE SCHOOL WORLD, vol. viii., p. 198, and the method of treatment indicated in that notice is followed in the section before us. The section contains the subject-matter of Euclid, Book II., Book III., 35-37, and Book IV., 10-16; but the treatment is not that of Euclid, and many theorems are included that are not to be found in the Elements, though contained in the modern editions of that work. In the discussion of rectangles, geometrical proofs as well as algebraical illustrations are given; algebraical illustrations are essential, and yet they are not sufficient as proofs from the purely geometrical standpoint so long as rational numbers alone are used. A proof may, however, be algebraic in its symbolism and yet geometrical in its essence, though beginners often fail to see this. The section is provided with numerous examples; these are no doubt useful, but there is a serious danger of overloading a book with theorems and exercises that are not really necessary to a sound grasp of geometrical principles.

Practical Trigonometry. By H. C. Playne and R. C. Fawdry. vii+156+xi pp. (Arnold.) 2s. 6d.—This text-book, while excellent in its practical applications, is also good in its theoretical development. In the earlier pages attention is chiefly restricted to acute angles, and many simple and interesting illustrations of the use of trigonometry in the solution of problems of the kind usually classified as "heights and distances" are given in the text and in the exercises. The discussion of the functions of angles greater than a right angle begins at p. 36, and, though perhaps condensed, is clear and good. The least satisfactory chapter, in our judgment, is chapter vi., on "Projection and Formulae for Compound Angles"; the

fundamental theorem on projection, considered as the basis for the proof of the Addition Theorem, needs more careful statement than is given in article 36. Probably the elementary character of the book is responsible for the somewhat meagre statements of that article, but chapter iv. contains all the material for a full presentation of the case. The exercises on logarithms are rich in practical examples, though possibly not necessary in a book on trigonometry. An excellent chapter on angles which are not in one plane and on trigonometrical surveying concludes the work. Though the analytical side of trigonometry seems to us to be too slightly treated, even for a book on practical trigonometry, and graphical work is not so fully utilised as it might be, the general impression made by a careful examination is decidedly favourable; the exercises are unusually good, and the pupil who masters the contents of the volume will have a good grasp of elementary trigonometry.

Pitman's "Method" Arithmetics. Part vii. 56 pp. (Pitman.) Paper, 4d.; cloth, 5d.—In addition to the continuation of fractions, proportion, interest, percentage, and mensuration, this part deals with profit and loss, averages, stocks, and miscellaneous problems (including some on the metric system). The examples of which the book is made up provide ample practice and seem to be chosen with care.

The Rational Arithmetic. Seventh Year's Course. By George Ricks. (Macmillan.)—The general character of this text-book is stated in THE SCHOOL WORLD, vol. viii., p. 437, this course also appearing as a Teacher's Book (price 8d.) and a Scholar's Book (price 3d.). The contents include stocks and shares, recurring decimals, the metric system, and curves.

The Geometry of the Screw Propeller. By William J. Goudie. 47 pp. (Blackie.) 1s. 6d. net.—This pamphlet consists of a reprint of a series of articles published in a technical journal. For students who possess a fair knowledge of the elementary principles of machine construction, the explanations given of the geometry of the subject and the numerous hints for the construction of simple models will be of great service.

Clive's New Shilling Arithmetic. Edited by William Briggs. viii+160 pp. (Clive.) 1s.; with answers, 1s. 3d.—This book is essentially a collection of exercises and problems for both oral and written work in schools, though the main definitions and rules are given in their appropriate places. The various sets seem to be well graded.

Science and Technology.

Conduction of Electricity through Gases. By Prof. J. J. Thomson. Second edition. viii+678 pp. (Cambridge University Press.) 16s.—A descriptive review of the original edition of this work appeared in THE SCHOOL WORLD for March, 1904 (vol. vi., p. 104). During the past three or four years much attention has been given by men of science—particularly those of the Cavendish Laboratory—to the nature and cause of electrical discharges through gases, and the corpuscular theory of electricity involved in this study. As a pioneer among modern investigators and interpreters of these phenomena, Prof. Thomson must be gratified at the marvellous developments of the field of inquiry opened by him, though the result has been that he has had to rewrite a large part of the original volume, and add more than one hundred pages, in order to give some account of what has been accomplished. To read or possess this authoritative statement of the position of the

most important subjects of study in physical science at the present time—the nature of electricity and the constitution of matter—written by a leading physicist, should be the intention of every teacher who desires to be in the current of scientific thought.

Practical Methods of Inorganic Chemistry. By F. Mollwo Perkin. vii+155 pp. (Constable.) 2s. 6d. net.—There is a feeling both in this country and in Germany that too little attention is paid by the chemical student to preparative inorganic work and that relatively too much time is always devoted to organic work. This book has been written to meet the needs of students making inorganic preparations, work which the author recommends should be carried on concurrently with the qualitative analytical course. Commencing with the preparation of some simple substances and the determination of the equivalents of magnesium, tin, &c., the methods of making and carefully purifying quite a number of simple and double salts, alums, &c., are described. The halogens and halogen compounds are next investigated, including such preparations as sulphur monochloride, sulphuryl chloride and silicon chloroform. Subsequent chapters deal with most of the inorganic acids and with the preparation of metals and metalloids, including a description of the Thermit process of welding. A final chapter contains a few special preparations such as hydrazine, nitro- and amino-guanidine and also gives methods of preparing colloidal solutions. Tables and data for the preparation of reagents are contained in an appendix. The directions appear to be clear and concise and sufficient theory is introduced to explain the methods used: it is perhaps a pity that the author has not thought it advisable to insert references to the original literature on the subject in the text. The habit of looking up the literature is one which cannot be acquired too early by the student.

Special Experiments and Discussions in Introductory Chemistry, with a Plan for the Organisation of the Subject-matter. By Eugene P. Schoch. vii+62 pp. (Heath.) 2s.—Although contributing one more, this time from the American side, to the legion of elementary text-books in chemistry, Dr. Schoch's work is of interest in that it presents some novel features. He starts from the standpoint that chemistry is not a recital of theories but that it deals with realities—with facts; these are to be known and studied and accordingly he treats the subject primarily as a progressive study and deals with the general properties of substances rather than presenting reactions as the evidence of special properties. The book is intended to be supplemental to the ordinary text-book and practical class work. If properly used it should be most useful in causing students to think instead of merely mechanically repeating certain experiments and learning equations. The sections dealing with the action of some general reagents on pp. 36 and 37 are particularly good and may be briefly detailed. The action of sodium hydroxide solution upon water-soluble metallic salts is taken as an example. It is pointed out in the first place that although hydroxides should be obtained in such reactions yet secondary changes may lead to the formation of other substances owing to dehydration or the dissolution of the precipitated hydroxide in excess of the reagent. The student is led to investigate the behaviour of a number of salts and find that some hydroxides are easily soluble in water and therefore only precipitated from concentrated solutions, others are sparingly soluble and more or less completely soluble, others again are soluble in excess, whilst others undergo secondary changes, especially in hot solutions. Accord-

ingly he is able to select those metals which the reagent can be used to precipitate and at the same time obtains a clear understanding of much of the procedure for analytical separations, generally dogmatically stated in other books. This illustration serves to show the trend of Dr. Schoch's method and we should not hesitate to put the book in the hands of the student.

Philip's School Gardening Diagrams. (Philip.) 7s. 6d. net.—This series of six wall-diagrams will be found useful in schools of practical horticulture. The sheets illustrate methods of planting, budding, branch-pruning, root-pruning, layering, and grafting respectively, and are well and clearly printed.

Art.

The "A.L." Leaves. Pressed and preserved between two sheets of transparent celluloid. Set of 12, in box, 7s. (Leeds: Arnold.)

The "A.L." "Celeritas" Drawing and Designing Cards. By an Art Teacher. In two packets, each containing 24 cards, 2s. 3d. each packet. (Leeds: Arnold.)

The "A.L." Series of Freehand Photo Copies on Cards. 24 cards, with instructions, 2s. 6d. per packet net. (Leeds: Arnold.)

Messrs. Arnold and Son are issuing a set of natural leaves of British timber trees and plants, from the Orpington nature-study prize scheme; the leaves are dried and pressed between two sheets of transparent celluloid, strongly bound at the edges. It is an ingenious device, and should prove useful to teachers of nature-study or drawing when fresh leaves are not available. The set consists of twelve well-known leaves of varied shapes, and is accompanied by some exceedingly lucid and suggestive descriptive and teaching notes.

The advisability of attempting to teach school children to "design" is a moot point, an opinion which obtains largely being that a child's school life (so far as drawing is concerned) should be spent in acquiring manual dexterity and in cultivating an acquaintance with what is good and beautiful in Art and Nature, thus laying up a storehouse of knowledge and skill on which to draw when occasion requires. From no point of view, however, can we find any justification for the publication of the "A.L." "Celeritas" Drawing and Designing Cards, by an "Art Teacher." Each card contains a drawing of a flower or spray, with a conventional rendering and a design based thereon. The drawing throughout is weak and often grossly inaccurate, stems and leaves joining in most impossible positions, and flowers stuck on at all angles. The designs are feeble and pointless; the border design, for instance, based on marigold leaves (No. 3), might with equal truth be said to be based on Indian clubs or on soda-water bottles. The colouring is crude, often garish. Altogether we must consider this an unfortunate and ill-advised publication, and one which, in the hands of the inexperienced teacher, who alone is likely to make use of it, may be capable of doing considerable harm.

The "A.L." Art Series Freehand consists of twenty-four reproductions of photos of textiles and ornament in relief, taken principally from the Board of Education examination tests, and will be found useful by teachers who are preparing their classes for examination in this subject.

A Manual of Historic Ornament. By Richard Glazier. 168 pp.; 600 illustrations. (Batsford.) 6s. net.—Mr. Richard Glazier's popular "Manual of Historic Ornament," an enlarged and revised second edition of which is published by Mr. Batsford, although intended

primarily as a text-book for art students and craftsmen, possesses a general and educational interest which will amply justify its inclusion in the school library. The book forms an epitome of the history of the evolution, traditions, and development of architecture and the applied arts from about 4000 B.C. to the middle of the eighteenth century; it takes a rapid and comprehensive survey of the main characteristics of each style, period, and country, giving a vast amount of precise information in a clear and succinct form. The 600 illustrations are admirably chosen as typical examples, and are excellently drawn and reproduced.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Greek for Beginners.

My attention has been directed to a notice in your February issue which severely censures an edition of easy selections from Thucydides, VI., on the ground that this author is beyond the reach of beginners in Greek.

Your readers, I think, should know that the reproof, whatever its weight, falls, not upon the shoulders of the editor of the volume, but upon the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield; for this selection of chapters was made by the Board as one of their set books for next July expressly on the ground that the simpler parts of Thucydides afford excellent material for the first Greek author studied by beginners. Your reviewer, no doubt, can hardly be expected to follow the proceedings of such remote northern academies; but whoever undertakes to review school books ought to be acquainted with the very excellent selections from Thucydides made for the same purpose in different series by such practical teachers as Dr. Rouse (Rivingtons' Series) and Mr. Colson (Macmillan's Elementary Classics); in the latter vocabularies are furnished. And if your reviewer could have found time to read Mr. Ure's thoughtful and most stimulating Introduction, or to observe the admirable scholarship and lucidity of his notes, I venture to think his verdict would have been different.

The general question, however, of the time at which the beginner should come to Thucydides is more important than the merits of any one edition, however excellent. Many years' experience of teaching Greek to very backward students convinced me that if the selections be properly made no other Greek writer gives the learner more quickly a grasp of the fundamental structure of the language; and to be able to introduce pupils at once to the greatest of historians instead of to the dull "parasangs" of Xenophon's "Anabasis" is an enormous gain. But lest I should appear to be setting merely my opinion against that of your anonymous reviewer, let me add that this was the regular practice at the City of London School in the great days of Dr. E. A. Abbott's rule. The present Chancellor of the Exchequer, Prof. J. S. Reid, Mr. Sidney Lee, Canon Beeching, Mr. P. A. Barnett, and the late Prof. Bendall—to mention no others—were all the victims of Greek training "of a type which" your reviewer "hopes is doomed to extinction."

R. S. CONWAY.

The University of Manchester.

My opinion is quite unchanged by the array of authorities quoted by Prof. Conway. These authorities have no

claim to speak for school work; if they had, I formed my opinion by reasoning and not by authority. I do not find fault with the use of Thucydides, or with the selection made by Mr. Ure, but with the whole conception of what is needed for a gradual introduction to Greek, exemplified by the combination of vocabulary, elementary notes, advanced notes, and long introduction. I have in my mind, and have tested, a different mode of introduction to Greek, and am aware by experience of what can and cannot be done or assimilated by classes of boys. My remarks have no application to beginners of the university age, but are confined to school classes, this journal being THE SCHOOL WORLD. If Dr. Abbott used this kind of book in the City of London School, I think that the acknowledged success of the City boys was due to some other cause which outweighed the faults of his system. Prof. Conway has no right to suggest that I have not read Mr. Ure's Introduction, and doubtless he used the words thoughtlessly.

THE REVIEWER.

On the Value of Vocabularies.

ONE always reads with interest the reviews of classical books that appear in your columns, but, as your reviewer's remarks will naturally have weight with publishers, there is one point on which I should like to break a lance with him. He has apparently a great antipathy to editions provided with vocabularies, and seems to lay down as a law that if boys can read an author they should use a dictionary. The point is one to be decided, not by theory, but by practice, and as the result of more than twenty years' experience in teaching boys of every standard, from Sixth Form to beginners, I say deliberately that in selecting books for the use of a Fifth Form (and those are the boys whose interests seem most concerned) I always choose editions with vocabularies, and I do this for three reasons:

(1) There is the question of expense—a very serious consideration, at any rate in town day schools.

(2) There is the problem of carrying books to and from school.

(3) There is the far more important point of education. I know full well the educational value of the painstaking and intelligent use of a dictionary, but I know also the heavy price that has to be paid for it. The question is whether the books are to be read simply as a linguistic discipline or as literature. If, as I believe, the latter is the true view, it is essential that the pupil's reading should be as extensive as possible, and I know that with Fifth Form boys of average ability I can in six months read with the help of vocabularies more than twice as much as would be possible if the boys had to use dictionaries. In accuracy the standard will be the same; in interest, in cultivation of taste, in the widening of the mental horizon the comparison is vastly in favour of the former method. Even as to intellectual discipline, I very much doubt whether there is any serious loss. The average boy with a dictionary is only too prone to take the first meaning he finds, and if this will not make sense to give up the passage in despair; with a vocabulary he does not feel so overwhelmed, and so tries more. I find, too, that even in the despised vocabulary about half the words are those which practically have only one meaning, and as to these there is a great saving of time (most important now that our classical hours are so curtailed) in not having to turn over the pages of a dictionary, while, as to the other half, a large proportion are used in two or more senses in the book read, and the boy has to employ his wits to discover which will suit the passage. As to the theory that look-

ing out a word in a dictionary will impress it on his memory a whit more than looking it out in a vocabulary, I am entirely sceptical.

The question is, however, one purely of experience, and as to this doctors may differ. All I am anxious for is that publishers shall recognise that your reviewer's prejudice against vocabularies is not shared by all schoolmasters.

May I add that I only wish I could find editions with vocabularies of all the books of Homer and Herodotus, of the more interesting speeches of Lysias, of Andocides "de Mysteriis," of Thucydides, Book IV., and of Sidgwick's "Scenes from Greek Plays"?

Leeds Grammar School.

A. C. PRICE.

TWENTY-ONE years' experience has led me to a different conclusion.

To take your correspondent's reasons:

(1) Special vocabularies are an enormous waste of expense. If a boy reads one text a term for two years he has bought six single texts with vocabularies, containing nearly all the same words. For the same sum, say 12s. to 15s., he could have bought a dictionary (3s. 6d.) which would have been enough for all his work up to the Fifth Form, and a whole text of Virgil, Horace, Caesar, and part of Cicero. If the calculation include three or four years, the waste of money becomes more marked still.

(2) Dictionaries need not be carried to and from school.

(3) Education.—Here a definite system is needed; the wants of the boy differ at each stage. At first the boy should use neither dictionary nor vocabulary, but be told all the meanings by his master. By degrees he should be given fewer and fewer meanings, the dictionary being referred to now and again in case of a chance omission or forgetfulness. But in all early stages the fount of information should be the master, the dictionary being only used for reference. The aim which your correspondent has in view would be served by notes, giving all meanings of new words; but this presupposes a graduated system, which it is clear your correspondent has not in his mind. The reasons which he assumes for my preferring a dictionary are not mine at all.

(4) It is worth while adding that it is convenient to have the text open whilst a word is being looked up, and inconvenient to have a glossary at the end of a book.

The subject is too wide to be dealt with in a note; for the use of dictionaries is part of the general question: How should Latin and Greek be taught? What is our aim, what are our methods? Do we wish to hear lessons or to teach? Is it information or education we give? What is the way to impart information, so as to lead the scholar to use it rather than to produce it on demand? If these questions seem to your correspondent out of place, it may suggest to him that there may be other problems which need investigation before one can form a true opinion on the matter of vocabularies.

THE REVIEWER.

The Direct Method of Teaching French.

AFTER so much discussion of the theory of the direct method of teaching modern languages, the interesting article in your last issue, dealing with the subject from the point of view of one who has tried to put the new ideas into practice, was welcome.

This review of the class difficulties the writer himself has experienced will be appreciated by numbers of school teachers of modern languages, who, while wishing to be identified with the forward movement, at the same time feel that circumstances often force them to heresy.

Mr. Richards attributes the first reason for his heterodox

tendency to the psychological differences in members of the same Form. Placing them roughly in two categories, first, the "bright," and secondly, the "dull" and the "shirkers," he doubts whether the new spoon "made in Germany" is destined to feed the latter division so effectually as to make them resemble exactly their "bright" brethren. If we share your contributor's doubts on this score (and who does not?), we shall sigh with him for smaller classes.

For my part, I do not see any insuperable obstacle, in the case where classes are large, to the plan of dividing the boys into two or three groups for conversational purposes. Each of the groups could be dealt with in the time usually allotted to a French period. At the holiday courses arranged for teachers abroad, this plan is always adopted, so as to give each person an opportunity of making some real progress in the spoken language. If these smaller circles are deemed essential, in spite of the advantages a residence abroad affords quite independently of the courses, how much more important does it become, here in England, where we are concerned with ordinary boys not particularly keen to acquire fluency in speaking the particular language they are studying.

I do not know if Mr. Richards's classes are graded, but, for my part, I consider the greatest obstacle to progress on reformed lines is the unhappy fact that it is possible for the lad who is advanced in all other subjects, but utterly ignorant of French, to be put in the Sixth Form, and for another who speaks French fluently (owing, perhaps, to his French parentage), but is behind in the ordinary English subjects, to be placed in the lowest Form.

Allow us to keep our boys in reasonably small classes from the outset until they leave school, uninterrupted all the while by intruders of all grades, and we shall be able to carry out the principles of the direct method to the letter; but, until we can persuade those whom it may concern to give us the necessary facilities, we shall have to fall back on some such compromises as Mr. Richards suggests in the latter part of his article.

William Ellis School, N.W.

CHARLES ORCHARD.

A Common Auxiliary Language.

THE question of the adoption of a common language for all extra-national purposes, political, commercial, social, &c., has come more and more to the front within the last few years, so that it is rare to find a newspaper or magazine which has not discussed the object earlier or later. The fact that such a common tongue would be a great boon is undoubtedly, but the question as to what it shall be is not so easily solved.

During the International Exhibition in Paris in 1900 a society was founded entitled the "Délégation pour l'adoption d'une langue auxiliaire internationale" (6, rue Vavin, Paris), and this has since attained a very large measure of success. It comprises at present representatives of more than 250 learned societies and professional associations of all countries, and has received the adherence of more than 1,000 members of academies and universities. Its purpose is to make choice of the auxiliary language through the intermediary of a competent international authority, such as the Association of Academies, for example, and it has just issued an urgent request that learned societies and professional associations will name a delegate to represent them when the time for a choice comes, that is, during the meeting, this year, of the Association of Academies. It is a curious fact that, looking through the list of the delegation, Great Britain is apparently the only country which has shown proof of

its indifference, no British delegate being recorded, except one from Wales, although the Colonies and the United States are to the fore.

It is probable that this results from two causes: first, the conviction which most Englishmen have that their own will be the international language; and secondly, the idea of teachers that in some way the adoption of a common auxiliary language will interfere with the teaching of French, German, &c. As regards the first, those who support the use of English are English people, and a certain number of foreigners, who with infinite pains and difficulty have learnt English, and do not wish to lose the profit this has gained for them; yet, let an Englishman travel through the by-ways of foreign countries, and he will find, not only that his English is useless to him, but also that the idea that it should be taught in every small school all over the world will provoke scornful laughter. If he, possessing a knowledge of the native language, tells the people of the country of his idea, they will ask him: "Why should we spend large sums of money, which could be better used, in order to make it perfectly easy for English people to travel anywhere, speaking their own language, and do business in any country, whilst the English themselves would not be burdened as we should be, because the language is their own?" Any sensible person will see that we cannot hope for the support of foreigners in making the study of the English language compulsory, and that unless they all consent to speak it our object cannot be attained. Of course, there are plenty to argue that in time English will, of necessity, be accepted, because foreigners cannot do without it; but the most sanguine do not reckon upon this happening for fifty years at the earliest, and meanwhile the need is a present pressing one. The Délégation does not propose to choose from any national tongue, having regard to national jealousies, French people, for example, being absolutely sure that French is, and must be, the only international medium.

Meanwhile Esperanto, a language perfectly simple, singularly accurate, phonetic, and logically correct, is in constant use amongst an ever-growing multitude of people in many countries.

Its adherents have arranged special technical sections, each having its secretary and array of correspondents in various countries, and being recruited from members of the legal profession, musicians, composers, trade unions of various kinds, doctors, littérateurs, and others; whilst as to its practicability and adaptability as a speech medium, such men as the Dean of Durham, Prof. Skeat, Mr. Oscar Browning, M. Boirac of Dijon, and the late Max Müller bear witness.

Nor does it depend upon the opinion of one or two eminent men. In the summer of 1905, and again at Geneva in 1906, a company of some 2,000 people, from twenty nations, gathered for the express purpose of proving the adaptability of Esperanto for all the purposes of human life; it was at this congress that the different sections were arranged. The next International Esperanto Congress will take place at Cambridge, and will last from August 12th to 17th. Already notifications of those intending to be present—educationists, professional and commercial men, idealists, and others—are coming in from every country in Europe, whilst Siberia and Japan on the one hand, the States and Canada on the other, are sending representatives. Moreover, the University has advised the Senate to grant the use of rooms if needed; the town of Cambridge has put its municipal buildings at the disposal of the congress, and the Union Society has unanimously decided to give

Esperantists the rights of honorary membership during the congress week, their debating hall having been offered for various important meetings. The last time this hall was lent was in 1885, and Esperantists are duly sensible of the honour accorded them.

It has been frequently stated that we of this generation are trustees for the next; it therefore behoves us to inquire carefully into anything which may be for the common weal. Seeing and hearing are believing, and thoughtful people will not despise the opportunity of proving whether these our coming guests are lunatics or wise men.

E. A. LAWRENCE.

Mowbray House, Norfolk Street, W.C.

Absolute Systems of Units in Dynamics.

The discussion on the "Teaching of Elementary Mechanics" by the British Association, of which the report has recently been published,¹ shows how vexed a question the choice of units of force and inertia still is, several of the advocates of the "academic" system (in which the unit of force is the *poundal*) entirely failing to understand the "engineer's" system (in which the unit of inertia is the *slug*).

Perhaps a very elementary discussion of the points involved, which has been found suitable for a class of beginners, may interest those who have to teach the subject.

When we speak of several bodies as each being "five pounds," say, we imply two things:

(i) The attraction of the earth on each is the same, and is equal to five times the attraction in the case of a certain standard body; i.e., each has a definite weight.

(ii) The behaviour of each of the bodies when acted on by a specified force is the same, the acceleration produced by the force being just one-fifth of the acceleration in the case of a certain standard body; i.e., each has a definite inertia (or mass).

It will be observed that inertia is a property of the body itself: weight depends also on the attracting body. Inertia is thus a fundamental property of the body, while weight is not. On the other hand, weight is a much simpler idea to beginners, since weight, like any other force, can be felt. As inertia and weight are always proportional to each other, beginners invariably confuse these two entirely different properties, just as confusion would arise between weight and volume were all substances of exactly the same density. (The confusion is partly due to the use of the word "mass," since in non-technical language to call a body "massive" means much the same as to call it "weighty.")

Now we have the well-known standard body, "the pound," of which innumerable copies exist, and this provides us both with the unit of inertia (or, if we please to call it so, mass) and also with the unit of weight. Thus the most natural unit of mass is the pound, and the most natural unit of force "the weight of a pound."

In statics, where we are not concerned with mass, we use as unit of force "the weight of a pound," which is almost invariably abbreviated into "a pound."

In kinetics we are concerned both with force and mass, since we are concerned with the behaviour of bodies under the action of forces.

Our reasoning here is based on the experimental laws.

(i) The acceleration produced in any body by an unbalanced force is proportional to that force (and in the direction of that force).

¹ Edited by Prof. John Perry, F.R.S. (Macmillan.) 2s. net.

(ii) A body's own weight produces in it an acceleration g , which is roughly 32 ft./sec.² (but differs slightly in different parts of the earth, being constant at any one place—in London $g=32.182$ ft./sec.² nearly).

From these we derive the equation: If an unbalanced force of F lb. (weight) acts on a body the weight of which is W lb., it produces an acceleration a given by

$$\frac{F}{W} = \frac{a}{g}$$

This, stated in one way or another, is the fundamental equation of dynamics.

The object of the *absolute* systems of units is to avoid the explicit occurrence of g in this equation and the others derived from it. In such an absolute system, the units of force and mass must be so chosen that when a unit force acts on a body of unit mass (and, therefore, also of unit weight) the acceleration produced will be unity.

This is done in two ways: (a) by a proper choice of the unit of force; (b) by a proper choice of the unit of mass.

In (a) we take the pound as the unit mass: then the unit of force is such as to give acceleration 1 to 1 lb., and this force is called the *poundal*. Since 1 lb. weight gives acceleration g to 1 lb., it follows that 1 lb. weight = g poundals.

The equation then reads: *measure of force in poundals = measure of mass in lb. × measure of acceleration in ft./sec.²*. This is also what is done in the C.G.S. system, for which *measure of force in dynes = measure of mass in grams × measure of acceleration in cm./sec.²*.

In (b), on the other hand, we take the *weight of 1 pound in London* as the unit force, the addition "in London" being necessary, as the weight of 1 lb. varies slightly in different parts of the earth. Then the unit mass, called the *slug*, is that mass in which the weight of 1 lb. produces acceleration 1 ft./sec.².

It follows that 1 slug = 32.182 lb. (approximately 32). The equation then reads: *measure of force in pounds = measure of mass in slugs × measure of acceleration in ft./sec.²*.

The choice of the absolute unit of angle in trigonometry should be compared with this, its use avoiding any constant in the equations $s=r\theta$; $\theta=\frac{s}{r}$.

To beginners, a general explanation such as has just been given is necessarily vague. The important thing is to consider a simple numerical instance, and to make perfectly clear the way in which g enters the equation in each of the three cases.

Consider, for instance, the question: *A force of 5 lb. (weight) acts on a body the weight of which is 9 lb.; what is the acceleration "a" produced?*

(i) Using simple proportion, a force of 5 lb. acts on a body the weight of which is 9 lb.,

$$\therefore \frac{5}{9} = \frac{a}{32}$$

(ii) Using the "academic" system of units, a force of 5×32 poundals acts on a mass of 9 lb.,

$$\therefore (5 \times 32) = 9a,$$

Here expressing the force in poundals brings in g .

(iii) Using the "engineer's" system of units, a force of 5 lb. acts on a body of inertia $\frac{9}{32}$ slugs,

$$\therefore 5 = \left(\frac{9}{32}\right)a,$$

Here expressing the mass in slugs brings in g .

It is to be noticed that in each case the g enters the equation; by a proper choice of units we simplify the appearance of the fundamental equation, but the laws of nature remain unaltered.

It may seem unreasonable to bother beginners with three methods of dealing with the same question, but to do so here has many advantages.

The distinction between mass and weight being the real crux, and the relation which gives the acceleration fairly easily, it is well to begin with the simple proportion $\frac{F}{W} = \frac{a}{g}$. This postpones the discussion of mass, and has the advantage that problems where F and W are naturally expressed in tons or ounces are just as easy as those where they are expressed in pounds.

Later, when the meaning of mass must be discussed, and it is desired to explain what is meant by an absolute system of units, it will be found scarcely more difficult—if not actually easier—to explain both the systems, of which each casts light upon the other, than to explain either of them separately.

C. O. TUCKEY.

Charterhouse, Godalming.

The Balance Hydrometer.

This instrument is a modified form of Nicholson's hydrometer, but a long, graduated brass tube takes the place of the short, thin wire in the Nicholson pattern (Fig. 1). The balance hydrometer is not of fixed immersion (although it may be used as such), and by means of it the densities of substances, both heavier and lighter than water, can readily be determined. The brass tube is divided into centimetres and millimetres, and is sufficiently long to deal with substances up to about 7 grams in weight. Another new feature of the hydrometer is the side-pieces which are attached to the top pan; these prevent the pan and its contents from being submerged in water during a determination.

Method of Using.—Lead shot, &c., is placed on the top pan until the zero of the scale coincides with the meniscus of the water in the glass jar. This is best seen by looking up from a point slightly below the surface of the water. Observations of the reading must always be taken from this point. Place the substance the density of which is required in the top pan. Note the reading when the hydrometer comes to rest. Now place the substance in the bottom pan, and again take the reading. The reading of the scale when the substance is in the top pan, divided by the difference of the two readings, gives the required density.

Example.—To find the density of nickel-silver.

Reading of scale with alloy in top pan = 8·20
" " " bottom " = 7·25

∴ Upthrust or loss in weight of alloy = 0·95
Density = $\frac{8\cdot20}{8\cdot20 - 0\cdot95} = 8\cdot63$

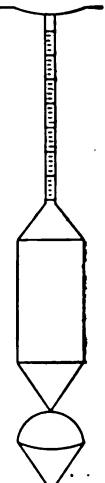


FIG. 1.—
The Balance
Hydrometer.

The hydrometer should prove of value in a junior physics laboratory, for it may have its "calibration curve" constructed in a similar manner to the dynamometer, thus giving rise to exercises in graphical work. In order to obtain the curve, start with the scale mark of the hydrometer at zero, and add weights, 1 gram at a time, until

the rests of the pan nearly rest on the sides of the glass jar. Plot the weights as abscissæ, and their corresponding scale-readings as ordinates. The joined points, when the experiment is carefully carried out, will give a straight line.

Weight in pan in grams.	Corresponding scale-reading in cm.
0	0
1	1.55
2	3.10
3	4.65
4	6.20
5	7.75
6	9.30

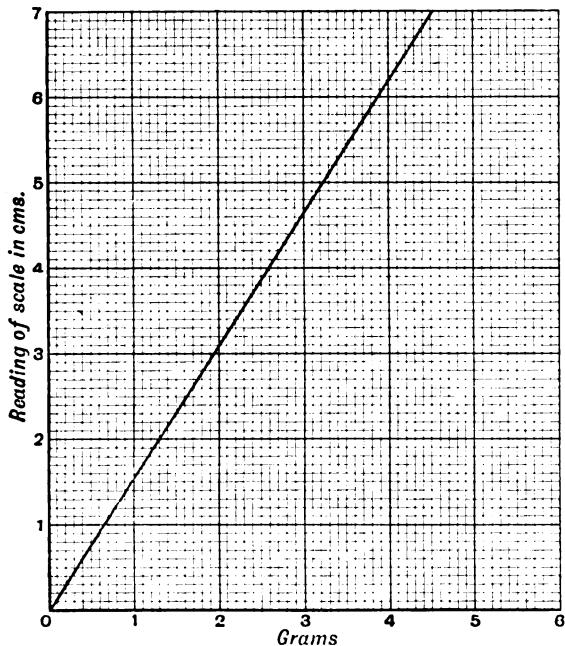


FIG. 2.—Calibration Curve for Hydrometer.

Example.—To find the density of steel, using the graph.

$$\begin{aligned} \text{Reading of scale with steel in top pan} &= 8.70 = 5.60 \\ " " " " \text{bottom}, &= 7.60 = 4.90 \\ \therefore \text{Upthrust or loss in weight of steel} &= 1.10 = 0.70 \\ \therefore \text{Density} &= \frac{5.60}{0.70} = 8 \end{aligned}$$

The density may also be obtained by finding the amount that the scale is depressed for 1 gram, and then dividing the readings obtained in an actual determination by this amount.

Example.—To find the density of a piece of metal.

It was found that 6 grams depresses the scale from zero to 9.30 cm.; therefore the depression for 1 gram is 1.55 cm.

$$\begin{aligned} \text{Reading of scale with metal in top pan} &= 9.15 = 1.55 = 5.903 \\ " " " " \text{bottom}, &= 7.95 \\ \therefore \text{Upthrust or loss of weight in metal} &= 1.20 = 1.55 = 0.7743 \\ \log. 9.15 &= 0.9614 \quad \log. 1.20 = 0.0792 \\ \log. 1.55 &= 0.1903 \quad \log. 1.55 = 0.1903 \\ 0.7711 &= 5.903 \quad 1.8889 = 0.7743 \\ 1.8889 \\ \hline 0.8822 &= 7.625 \\ \text{Density} &= \frac{5.903}{0.7743} = 7.625 \end{aligned}$$

Determination of the Density of a Substance Lighter than Water; e.g., a Piece of Wood.

The method is the same as before, but it is necessary to depress the scale, by means of lead shot, nearly half-way in order to allow for the extra upthrust which occurs in the case of a substance lighter than water.

Example.—To find the density of a piece of oak.

$$\begin{aligned} \text{Reading of scale with oak on top pan} &= 8.75 \\ " " " " \text{without}, &= 7.25 \\ \therefore \text{Weight of oak} &= 1.50 \end{aligned}$$

$$\begin{aligned} \text{Reading of scale without oak in either pan} &= 7.25 \\ " " " " \text{with}, &= 5.15 \end{aligned}$$

$$\therefore \text{Upthrust or apparent loss in weight of wood} = 2.10$$

$$\text{Density} = \frac{1.50}{2.10} = 0.71$$

It will be seen that the hydrometer may be used as a direct-reading instrument, thus saving a lot of time; as well as doing away with the using of weights. To ensure greater accuracy, the brass scale, after being immersed, should be lightly rubbed over when standing above the water, so that any small adherent drops may be removed before making a further determination. The hydrometer has been patented, and may be obtained direct from Messrs. W. and J. George, Ltd., Great Charles Street, Birmingham.

E. T. BUCKNELL.

St. Philip's Grammar School and the Oratory School, Edgbaston, Birmingham.

De Vigny's "Histoire de l'Adjudant."

ONE is always doubly grateful to a reviewer for pointing out misprints; it gives one a chance of correcting them in a subsequent edition, and it shows that the reviewer himself has read the book, which is not always the case with reviews.

One good "turn" (whether comic or otherwise) deserves another, and as your critic has ventured to ask me to note three misprints in my edition of de Vigny's "Histoire de l'Adjudant," may I venture to ask him to note that he has himself perpetrated a misprint in the case of one of the three (*faire* does not occur on p. 10, l. 20)? 33½ per cent. is a pretty stiff percentage of error in one who poses as a stickler for accuracy.

CLOUDESLEY BRERETON.

THE misprint is on p. 10, l. 26.

THE REVIEWER.

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THE

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The School World

A Monthly Magazine of Educational Work and Progress.

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APRIL, 1907.

SIXPENCE.

THE GEOGRAPHY OF THE BRITISH ISLES.

By A. MORLEY DAVIES, B.Sc. (Lond.),
Associate of the Royal College of Science.

I.

WHETHER geography is best introduced to children by exciting their interest in the strange and distant, or by building upon their actual knowledge of their immediate surroundings, is a question sometimes raised; to which the obvious answer seems to be that the two methods may well be used simultaneously. Few will dispute that too much reliance on the former method does not conduce to accuracy; and that one who has acquired only inaccurate notions of his own land, which he has in part seen, can scarcely possess clear ideas of distant lands that he has never seen, however vividly he may realise some of their peculiarities of detail. Yet examiners continue to report that candidates show serious ignorance of the characters of their own land. "The sense of perspective, of a correct mental picture of the main outlines of relief and of direction and distance was almost entirely absent," reports one recently. Evidently there is something wrong in the ordinary methods of teaching British geography.

The usual text-book method is to take each kingdom briefly as a whole, and then describe it county by county. Now the division of Britain into counties is of considerable historical interest, and, with numerous readjustments, serves passably well for modern local administration; but it bears very little relation to the distribution of modern industry and commerce. Accurate knowledge of our county system may be useful to a candidate for a clerkship at the Local Government Board, but it is valueless to a railway-clerk, a post-office sorter, or a commercial traveller. The concentration of attention on these artificial areas withdraws it from those broad natural divisions upon which the localisation of industries and routes of communication depend. It should be quite enough for any educated person to know whereabouts on the map any county lies, and to have an idea of its approximate extent; attempts to impart more exact knowledge of county areas than this are mere waste of time.

No. 100, Vol. 9.]

I propose to indicate in outline how the topography of Britain can be treated scientifically, so as to bring into interdependence what otherwise appear as a series of disconnected facts. But no cut-and-dried scheme suitable for any and every teacher will be suggested. Personal ideas and interests must largely guide every teacher. The common basis necessary for all successful teaching includes three things:

(1) A thorough realisation of the broad facts of surface-relief, which can best be acquired by the study of orographical maps, *i.e.*, maps coloured according to altitude. Such maps are to be found in most recent atlases; or for more detailed study of particular parts of Britain there are Bartholomew's excellent cycling maps on the scale of two miles to the inch.

(2) An elementary knowledge of the geological structure of Britain, towards which the new colour-printed map of the British Isles, published by the Geological Survey at the low price of two shillings, will be of great assistance. Those to whom a geological map is a meaningless muddle of colours will find an excellent introduction to the subject in the sixpenny "Guide to the Geological Model of the Isle of Purbeck" published by the Geological Survey.

(3) An understanding of the general climatic conditions of the British Isles.

Every teacher who is keenly interested in the subject will study the synthetic treatment of it in Mackinder's "Britain and the British Seas" (Heinemann).

In seeking for the primary natural divisions of Britain we find that while Scotland and Ireland can be treated as unities, England and Wales exhibit much greater diversity. There is, however, sufficient contrast between the north and west on the one hand, and the south and east on the other, to justify our treatment of these two regions as units equal in rank to Scotland and Ireland. Though no absolute boundary can be drawn between the two, the most convenient line to take as separating these two regions is a curving line from the mouth of the Tees to the mouth of the Exe, following approximately the geological boundary between the Lias and the Oolites. Except that it is breached by the Humber and by a few less important streams, this line forms a

L

watershed for its whole length, and is in many parts of its course a conspicuous natural feature. It loses its distinctness, however, in Dorset and Devon, and to a less extent in the Midlands.

We will now consider each of these four primary divisions of Britain under the several headings of Relief and Geology; Climate; Rivers and Communications; Industries and Town-sites.

RELIEF AND GEOLOGY.

1. South-Eastern England.—This is a relatively low-lying region, only isolated points attaining an altitude of 1,000 feet. It shows, however, a well-marked relief of a very regular type—a series of alternating ridges and broad vales, the ridges being of the type known to geologists as escarpments. The essential feature of an escarpment is that one face of it is very steep (this is the escarpment proper), while in the other direction the slope is so gentle that it constitutes almost a plateau. Geologically, an escarpment is the result of the superior resistance of some hard rock, such as a limestone, as compared with the softer rocks, chiefly clays, of which the vales are composed. Escarpments and vales are characteristic of all regions where strata of varying degrees of resistance lie, not horizontally, but with a gentle inclination or dip. The gentle,

plateau-like slope away from the escarpment-crest answers to this inclination of the strata as a whole, and it is known to geologists as the dip-slope. As we follow the dip-slope downwards, we find the resistant rock finally dipping underground below softer strata which form the floor of a second vale, which may in turn be followed by a second escarpment (Fig. 2).

At its best, an escarpment runs in a very straight line for a considerable distance, and the only interruptions are clean-cut valleys crossing it at right angles—a few of these occupied by

rivers flowing in the direction in which the strata dip, but many being dry notches at the heads of the valleys that furrow the dip-slope. Such notches as these do not spoil the distinctness of the escarpment.¹ But when important streams flow in the opposite direction to the dip of the strata, they and their tributaries cut so deeply into the escarpment that it largely loses its distinctness. Such rivers are the Bristol Avon and the Yorkshire Derwent.

In England the strata known as the Lower Oolites (from the abundance of oolitic limestone among them) form a well-marked escarpment-edged plateau extending without much interruption from the mouth of the Tees to the mouth of the Exe, serving, in fact, as the frontier of our area. This line of high ground is known by different names in various parts of its course—Yorkshire Moors, Lincoln Heights, Rockingham Forest, Edge Hills, and Cottswolds. This is followed to the east by a broad vale of clay—including the Fens, Vale of Aylesbury, and Vale of

White Horse; beyond which comes the Chalk escarpment—Yorkshire and Lincolnshire Wolds, East Anglian heights, Chilterns, and Marlborough Downs. Instead, however, of being strictly parallel to the Oolite escarpment, this one encroaches upon it in two places, the intervening vale being there absent or indistinct, viz., in the East Riding of Yorkshire, and in the borders of Dorset, Devon, and Somerset.

In the latter region, owing to the strata being nearly horizontal, the escarpments are broken up into a series of separate hills.

The Chalk dips under the clays of the London district, but instead of this dip continuing, the strata rise again on the south, the Chalk forming another escarpment—the North Downs. The

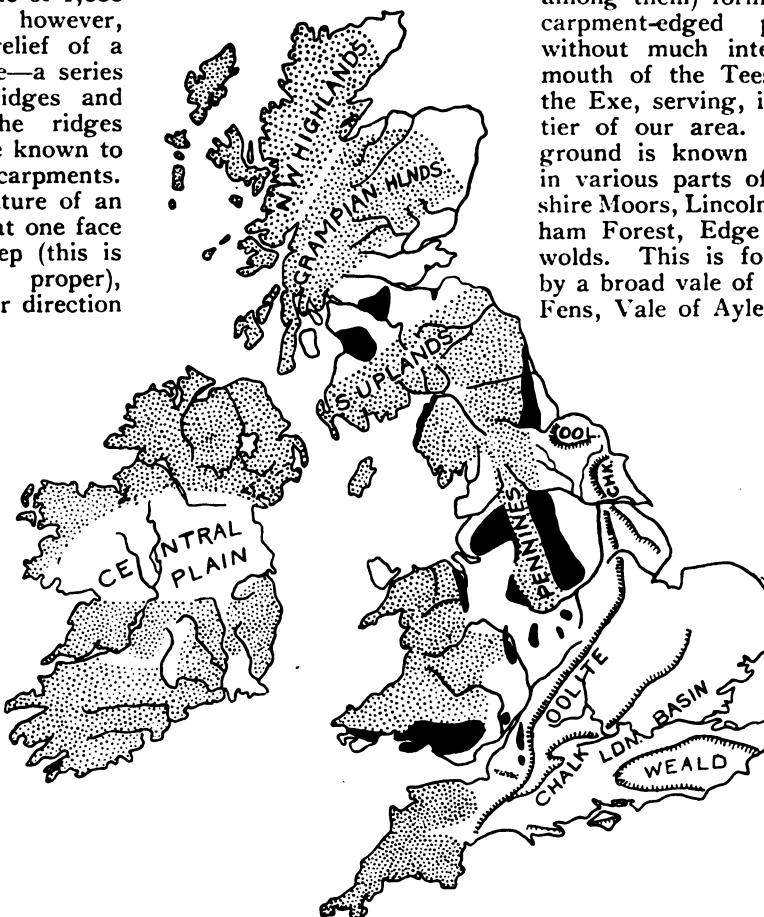


FIG. 1.—Diagram-map of the natural regions of the British Isles. Black areas are coal-fields; dotted, uplands; lines with dashes are escarpments, the crest of the escarpment being marked by the unbroken line.

¹ Readers of Prof. W. M. Davis's very interesting and suggestive little book on "Physical Geography" (Ginn) will find the term "cuesta" there used to denote the whole of an escarpment-edged plateau dipping gently down, to which the term "escarpment" is somewhat loosely extended by most English writers.

area lying between these two Chalk escarpments is called the London Basin (though strictly it is only a fragment of a basin, its completion having to be sought in Belgium). The North Downs are part of a great horseshoe-shaped escarpment, the opposite limb of which forms the South Downs; this horseshoe is linked to the Marlborough Downs escarpment by the great Chalk plateau of Salisbury Plain. The area enclosed by the horseshoe is called the Weald. Yet another Chalk escarpment forms the backbone of the Isle of Wight and Isle of Purbeck, between which and Salisbury Plain lies the Hampshire basin, a repetition of the London basin on a smaller scale, with the Solent occupying the place of the Thames estuary.

All these escarpments rise to a height of 600 to 800 feet above sea-level. For most of their lengths escarpments are watersheds, but are cut across occasionally by river-valleys; thus the Thames between Oxford and Reading cuts across the Chalk escarpment, the Humber cuts across both Oolite and Chalk, the Witham at Lincoln cuts the Oolite, and the Wey at Guildford the Chalk escarpment. In addition to these river-valleys, the crests of the escarpments are notched

(2) the Lake District, connected to the Pennines by the narrow neck of Shap Fells; (3) Wales, exclusive of the lowland border of the Bristol Channel, but inclusive of the upland parts of Shropshire and Herefordshire; (4) Devon and Cornwall. Minor upland areas are (5) the Black Country and (6) the Mendips.

The contrast between uplands and lowlands in this region is far greater than that between escarpments and vales in the south-east. Not only do the uplands attain to greater heights, but they are broad expanses of high ground instead of narrow ridges: thus they offer far greater difficulties to communication. Consequently they are in many places very thinly populated, and were so everywhere in former times, before modern industrial processes had come into use.

But this region is especially distinguished by its mineral wealth, and above all its coalfields, which lie mostly on the margin between uplands and lowlands. The distribution of population in this region has consequently come to be very uneven—dense on the coalfields, moderate and evenly distributed on the plains, very sparse in the uplands where there are no mines.

Of minerals other than coal, iron-ore is found



FIG. 2.—Diagram-section across a land of Vales and Escarpments. E, E, escarpments. Parallel lines denote softer rocks; perpendicular shading, harder rocks. This section may be taken as giving in a very diagrammatic way a section from Gloucestershire to Sussex, the alternate vales and hills being, from left to right, Severn Valley, Cotteswolds, Vale of White Horse or of Aylesbury, Chilterns, London Basin, North Downs, Weald, South Downs.

at intervals by gaps from which dry valleys run down the dip-slope: the deepest of these notches are almost as deep as river-valleys, and, like them, are of the greatest importance as routes of communication.

The region of escarpments and vales has certain important negative features. Chief of these is the absence of coal, except in places at such great depths that it is not yet worked. Other minerals also are scarce—the Oolite belt yields good building-stone, and here and there (Northants and Cleveland) valuable iron-ore. Chalk and its flints are extensively quarried; the clay-vales provide brick-earth, and here and there are miscellaneous minerals, such as fuller's earth, sand, and firestone, but no metalliferous ores except iron-ore.

2. Northern and Western England (with Wales).—Although escarpments are found in this region, their importance is overshadowed by that of other structures. This region might be compared to an archipelago—the islands being represented by upland areas of varying size and shape, and the intervening sea-channels by an irregular branching lowland, largely floored by clay, red marl, and red sandstone. The principal upland areas are as follows: (1) The Pennine Upland, extending from the Scots border to Derbyshire;

largely in the coalfields, lead-ore in the Pennines and Mendips, tin- and copper-ores in Cornwall. Building-stone is found almost everywhere, slates only in the westernmost uplands (the Lake District, North Wales, Cornwall). Brick- and pottery-clays are found in the coalfields and in the red marls of the lowlands, while the finest china-clay is formed from the decomposition of the Cornish granites.

3. Scotland is very sharply divided into three parts—the Southern Uplands, Central Lowlands, and Highlands, the last-named being separated by the straight cut of Glenmore into the Grampian and North-Western Highlands, while a number of small lowland strips lie along its eastern coast (Caithness, the Moray Firth borders, and Buchan).

The Southern Uplands and Highlands are plateaux cut up to some extent by river-valleys, of which the Tweed valley is the broadest. Except in these valleys the population is extremely scanty, as minerals are wanting. All the coal, and consequently the great bulk of the population of Scotland, occurs in the Central Lowlands. These lowlands are so called in distinction from the other divisions of Scotland, but they include within their area hill-ranges, such as the Ochils and Sidlaws, of greater altitude and more rugged

character than the hill-ranges of S.E. England.

4. *Ireland* is a country whose contrasts with Scotland are the more sharply accentuated by reason of certain superficial resemblances. It has about the same area and the same population, but the population is uniformly scattered instead of being concentrated in one division. It can also be divided into a central plain and northern and southern hilly regions, but the latter are quite unlike the Highlands and Uplands of Scotland, since they consist of scattered groups of high ground, not continuous plateaux cut up by deep river-valleys. The coalfields of Ireland are few and small, and though anciently a great gold-mining land, it now yields only some iron and aluminium ores (in Antrim), and ornamental marbles in the north-west.

CLIMATE.

The climate of a region includes its temperature and rainfall, considered not merely as to their average or total quantity, but also as to their distribution over the year. The rainfall of the British Isles has no strongly marked seasonal contrasts, and the average annual rainfall of different areas is sufficient for our purpose; but in the case of temperature the annual range is far greater in some parts than in others.

Our rain being mostly brought to us by the south-westerly winds from the Atlantic, the rainfall is greatest in the west and diminishes steadily eastwards. It is especially heavy on the western side of the great upland masses, and light on their eastern side and in the lowlands.

Our temperature in summer is chiefly dependent on latitude, though the Atlantic Ocean exerts a cooling influence on the land near it: the isotherms at this season run roughly east and west, the temperature diminishing northwards on the whole. But in winter the principal source of warmth is the latent heat set free in the condensation of water-vapour, and therefore the wettest regions are the warmest: at this season the isotherms run north and south. This remarkable course is part of the great northerly embayment of the isotherms which forms so marked a feature on the winter temperature-map of the world in the North Atlantic, and indicates the ice-free condition of European harbours in contrast with the ice-bound state of the American side.

1. *S.E. England* is relatively dry, and relatively extreme in its temperature-range, both of these features tending to become more marked to the east, with modifications due to the tendency of inland temperatures to be more extreme than those of the coast.

2. *N. and W. England and Wales* are much damper, but with a fairly dry margin to the east, especially on the east coast north of the Tees. They have a milder climate than S.E. England on their sea-borders, but a more extreme range of temperature in the uplands.

3. Of *Scotland* much the same may be said: the west coast is the wettest part of the kingdom

and has very mild winters, while the east coast is comparatively dry, with cold winters.

4. In *Ireland*, owing to the absence of any very extensive masses of high ground, the rainfall is much more evenly distributed, and is everywhere rather high. Hence the "Emerald Isle" is better suited for pasture, cattle-raising, and dairy-farming than for corn-growing.

WOMEN TEACHERS IN AMERICA.

By H. W. HORWILL, M.A. (Lond.), B.A. (Oxon.).

IN no country has the doctrine of the intellectual equality of the sexes been more fervently preached and more generally accepted than in the United States. That there should be no discrimination between boys and girls in the offer of educational opportunities is the orthodox creed of all varieties of American writers and speakers. The widespread practice of co-education is the most obvious example of its application. But there is a striking, not to say glaring, exception. In educational matters the male sex lies under one grave disability. Boys and girls may alike be taught, but only women may teach them.

The word "teacher," a common noun in England, is in America allotted to the feminine gender, and "she," not "he," is employed as the corresponding pronoun in addresses and articles on school work. In America the fact that a small minority of men make a living by teaching does not prevent it from being quite natural to think of the average teacher as a woman, just as in England if we happen to speak of a dress-maker we say "she," although we all know that a certain number of men make costumes for the opposite sex. In American secondary and primary education there is practically no career for men as teachers except in private schools. They may be appointed superintendents and principals, but outside such administrative posts their representation in the teaching profession is not only small but steadily dwindling. In the latest report of the U.S. Commissioner of Education the statistics for the common schools of the whole country, including both primary and high schools, show only 113,744 male teachers out of a total of 455,242, or a percentage of 25.¹ This low figure has been reached by yearly decreases from a percentage of 42·8 in 1880. The proportion of male teachers appears to vary inversely to density of population. While the percentage for the whole country is 25, that for cities of from 4,000 to 8,000 inhabitants is as low as 10·9, and that for cities of over 8,000 inhabitants drops to 7·5—only 7,289 male teachers to 89,335 female. If we take examples of large cities from all parts of the country we find the tendency uniform:

¹ These statistics, as those which follow, refer only to persons actually engaged in teaching, and do not include supervising officers, who are separately classified by the Commissioner.

	Male Teachers	Female Teachers	Male Pupils	Female Pupils
Boston ...	238	1,997	50,633	48,696
New York ...	1,166	11,408	312,882	309,319
Philadelphia ...	187	3,503	98,549	100,969
Baltimore ...	151	1,541	40,224	41,358
Washington ...	156	1,234	23,605	26,184
New Orleans ...	18	813	14,917	16,623
Cleveland ...	94	1,237	34,904	33,908
St. Louis ...	56	1,654	40,608	43,425
Chicago ...	301	5,015	140,277	138,906
Minneapolis ...	27	850	20,174	20,943
San Francisco ...	57	854	23,017	23,324

In running one's eye over the tables in the report one lights upon contrasts that are almost grotesque. Thus Atlanta, Ga., has only 8 male teachers out of a total of 241; Bridgeport, Ct., 6 out of 250; Wilmington, Del., 9 out of 252; Albany, N.Y., 8 out of 288; and Reading, Pa., 9 out of 330. Just across the Hudson River from New York, Jersey City has 3 out of 600 (though with 15,556 boys in its schools) and Hoboken 1 out of 201. Among other New Jersey figures are Camden 7 out of 327, Paterson 8 out of 369, and Trenton 8 out of 235. Not one male teacher is reported from Augusta, Ga.; Elmira, N.Y.; Peoria, Ill.; or Evanston, Ill. (the last-mentioned a prosperous suburb of Chicago); although the female teachers number as many as 105, 143, 267, and 90 respectively.

Estimates have sometimes been published of the percentage of American boys who "never come into contact with a male teacher." This must obviously be difficult to ascertain, as the regular promotion of children from one class to another, to say nothing of the employment of instructors in special subjects, makes it possible that in a school reporting five female teachers to one male every boy might, for part of his school career, receive teaching from a man. But it is certainly no exaggeration to say that the contribution of male teachers to the education of American boys in the "public schools" is so slight as to be practically a negligible quantity.

Divergent opinions have been expressed of the effect of these conditions, but certain conclusions may be regarded as established. In the first place, the administration of secondary and primary schools is, in America, much more largely than in England, in the hands of persons who have served but a brief apprenticeship in actual teaching. Male teachers of any ability who fail to secure a principalship within a few years turn aside to some more promising occupation, and when a vacancy occurs there is no large body of men, ripened by experience in the class-room, from which to draw.

Secondly, the preponderance of women gives a manifest bias to the curriculum. Some of the Mosely commissioners expressed their surprise at seeing women teaching woodwork to boys; it seemed "unsuitable employment and too great a strain on a woman." And the woman will certainly escape such tasks if she can. It is well known that women students in the universities prefer what are known as the "cultural courses," very few of them attempting any scientific study.

Women teachers show the same preference. Writing in the *Popular Science Monthly* for September, 1904, Mr. R. L. Sandwick quotes the case of a rural community in California where it was suggested that a little instruction in the laws of the pulley, lever, wheel and axle, &c., would be of service to the lads in view of their future work on the farms. After a short trial the experiment broke down. The teachers were women, and were not interested in mechanics. Mr. Sandwick believes that the steady decrease in the proportion of boys who are studying physics and chemistry—a decrease "out of all harmony with modern industrial demands"—is due in large measure to the meagre scientific equipment of women teachers.

There is no such general agreement as to the next point—the efficiency of women teachers in training the characters of boys. On this subject most people are content with *a priori* generalisations. Certain qualities are more commonly found in women than in men; therefore these qualities will predominate in boys trained by women. Thus the apologist of the present system discovers in these boys a gratifying tendency to unselfishness, sympathy, and gentleness, while the objector detects in them an excess of sentimentalism and a lack of manly sturdiness. One of the Mosely commissioners reported that the preponderance of women teachers was producing "an effeminating effect on the character of American boyhood"; another noted as its consequence "a strange and indefinable feminine air coming over the men." This criticism was not, on the whole, well received in America, and many replies were forthcoming. The *Chicago Tribune* characteristically appealed to the highest authority possible by inviting the schoolboys of its own city—the teaching staff of which then included 4,746 women and only 390 men—to declare whether they were becoming effeminate, and their testimony in rebuttal gave much comfort to the anxious inquirer. More convincing evidence, perhaps, is that which is ready at hand to anyone who has had personal experience of the American boy, especially at or near the Fourth of July, or, in fact, to anyone who reads the American papers regularly. It happened oddly enough that, just at the time when the Mosely report appeared, the *New York Press* was publishing day by day instances of astounding juvenile lawlessness throughout a large section of the city, a section where the common school is supposed to exert an especially refining influence. The "effeminate" small boys of New York were persistently making unprovoked and deadly attacks upon automobilists and even upon travellers in old-fashioned horse-carriages; to such an extent, indeed, that it was seriously proposed to guarantee police protection by a certain route only, abandoning the attempt to put down this disorder in general, and leaving drivers who went through other streets to do so at their own risk.

The belief that the preponderance of women

teachers impresses upon the boys feminine characteristics, whether of gentleness or weakness, has, in short, no support in facts. The New York *Churchman* has suggested in a leading article that this belief is due to a neglect to observe accurately how the mind of a boy is really influenced by his surroundings, and that the juvenile "hoodlum"—*Anglice* "hooligan"—is produced not in spite of, but largely because of, this preponderance. It is pointed out that the task of wisely controlling and guiding the energetic impulses of the boy, so much more aggressive than those of the girl, can only be accomplished by a teacher who has himself experienced them. The woman teacher, on the other hand, is in the boy's world an alien, and is respected for her good qualities without being recognised as a pattern to follow. "Her counsels," continues this editorial, "are promptly discounted as the speculations of an outsider who has no understanding of that outlook upon life enjoyed only by members of the superior class. For the cultivation of his manly aspirations he has to turn to the society of his schoolfellows. His teacher's womanly ideals he admires for girls, and rejects for himself. His own manly ideals he has perforce to originate. The resultant public opinion of his order is therefore essentially of the barbaric type, mitigated, not by the influence of a senior whose surplus of energy has been transmuted from savagery to manly strength, but by the fear of the patrolman."

It is worth noting, by the way, that there is one phase of a man's training with regard to which the woman teacher is more obviously than in others an alien and an outsider. The functions and responsibilities of government are taught in most American schools under the name of "civics," and distinguished Americans have sometimes been pleased to commiserate us on the absence from our curriculum of any such stimulus to patriotism. In America the teacher of civics is usually a person who has no vote, who has no personal acquaintance with the working of political and party institutions—except in so far as "pull" may assist toward promotion—and who takes little, if any, interest in the political problems of the day. Here again there are opportunities of testing the tree by its fruits.

On the whole, then, if the question of educational efficiency alone is considered, the balance of argument appears to be strongly against the existing system. It must be remembered, too, that the prevalence of this system is not the result of any deliberate choice on educational grounds. The arguments in its favour are an afterthought. They were not discovered until the country woke up to the fact that the regimen of women had become actually established. The present stage has been reached by a process of drift, not of reasoned conviction. The Civil War, by diverting so large a proportion of the male population to military uses, gave the schoolma'am her chance. Her hold was confirmed by

the industrial and commercial activity of the years following, when ambitious young men found other careers more attractive than the educational. Even to-day the proportion of men teachers fluctuates with the fluctuations in national or local prosperity. In the summer of 1902, for instance, it was reported that in Iowa an increase of business was leading to a decrease of men teachers. "The male part of the teaching population," said the Superintendent of Public Instruction, "is decreasing at a rapid rate, because times are prosperous and men see they can make more money in other lines. If times should change for the worse, then many men who have formerly taught would brush up again, obtain certificates, attend institutes, and go back into the schoolrooms."

It would be easy to accumulate evidence to show that, after all, the main reason for the employment of an excess of women teachers is the economic one. In the words of Dr. W. H. Maxwell, superintendent of the public schools of Greater New York and late president of the National Education Association, "to increase the efficiency of the public school teaching force by increasing the number of efficient men teachers—men who would devote their lives to the work—would involve a largely increased expenditure of money." And however earnestly it may be contended that women are superior to men as teachers for boys, it is significant that when once the financial difficulty is surmounted these arguments are no longer heard. There are, for example, many expensive private schools where the high fees charged make it possible for good salaries to be paid. In making appointments in such schools principals and governing boards prefer to follow the old-fashioned plan. And it is a curious fact that, while women are in so great a majority as teachers in primary and secondary schools, an exactly opposite tendency is found when we turn to higher education. In this sphere, for whatever reason, places are found for men and men are found for the places. The faculties of men's colleges consist of men only; in co-educational colleges the proportion of women professors is far below the proportion of women students, and it is not unusual to find a considerable number of men on the staff even of those colleges which have been established for the education of women alone.

Plant Life Studies in Garden and School. By Horace F. Jones. xii+260 pp. (Methuen.) 3s. 6d.—This is a tantalising example of a good book which might have been made very much better by greater care in construction. The course laid down is essentially practical in character, but some of the instructions—especially in the early part of the book—are too vague to be of much help to beginners. The frequent use of unexplained technical terms is also unfortunate. In spite of these drawbacks, the book on the whole is a valuable one, and may be recommended with confidence to teachers. The illustrations, 320 in number, are excellent.

ON ENGLISH BOOKS.

By W. H. D. ROUSE, Litt.D.

Headmaster of Perse School, Cambridge.

SOCRATES. Good day, Thrasymachus; what a long time it is since we saw you. Whence and whither bound? You seem like one in haste.

Thrasymachus. Aye, indeed, Socrates, and well I may! for I have just been listening to a lecture which made my blood boil.

S. And what was that?

T. One Leon, a Sophist, has been discoursing to great crowds upon the teaching of English literature; but he talked such nonsense that I was fain to bounce out into the street.

S. What did he say?

T. He gave a long list of the best authors for school reading, dull dogs all, and left out those which alone are of any use.

S. But how long is it, Thrasymachus, since you busied yourself with this matter? Last time you were here, we knew you as a champion of natural philosophy, a doughty champion indeed, for no man could stand against you. We thought you had proved sufficiently that only natural philosophy was of any use, and all else was a waste of time.

T. So it is; but if you do waste your time, you may as well waste it to some purpose.

S. Partly I agree with you, my friend; it is well to do everything with a purpose. So you have learnt English literature since we met last, and now you would show us how it is to be taught? That would be indeed a great boon; there are some, you know, who say it cannot be taught at all.

T. They are fools, Socrates; I say it can be taught.

S. I wish you would convince me of that, Thrasymachus; for my part, I am not fully assured in my own mind, and I am even not sure what English literature is.

T. Oh, that is easily told. Books!

S. But do not the teachers of English literature teach books?

T. Yes, they do, and that is why they fail; they ought to throw their books aside, and go into the open air, and take off their coats, and teach in their shirtsleeves.

S. But if they throw books aside, how can they teach books?

T. They need not teach books; they should let the stream of English literature flow pure and undefiled through the youthful mind.

S. But I thought we had admitted that English literature consists of books?

T. It does; but most of the books are classics, and the vast majority of our teachers cannot expound the beauties of our classics with advantage; so I say, Hang classic literature; browse on books.

S. But what books? Believe me, I am puzzled; for I thought the classics were also books. Or

do you distinguish English literature from the classics, and do you mean by classics Greek or Latin?

T. Heaven forbid! I hope we shall soon see the last of that pernicious stuff, with its fairy stories and heathen myths. Natural philosophy has given the death-blow to Latin and Greek, I hope.

S. Then what do you mean by classical literature?

T. English classical literature.

S. But how does English classical literature, that is, how do English classical books, differ from other books? Tell me, what is the meaning of classical?

T. Oh, bother it, I don't know; but I know the classical books are useless.

S. But if you do not know what a thing is, how can you know that it is useless? Or look at the matter thus: if we desire to know the meaning of a word which we do not know, how are we to find out?

T. Look in the dictionary.

S. So we will. The dictionary explains classical authors as the standard authors in each literature. Now tell me, is not the standard that by which things are judged? As, for instance, the standard pint and the standard foot-measure are those by which other measures are judged?

T. Yes.

S. And if the other measures fall short of or exceed the standard, they are judged to be inferior?

T. I grant it.

S. The standard, therefore, is superior to that which is not the standard?

T. I suppose so.

S. English classical literature, then, is superior to other English books?

T. So it would seem.

S. And those which remain are inferior?

T. That follows, if we were right in our admissions.

S. Do you think, then, that in teaching English literature, we must neglect the standard or superior books, and browse on the inferior books?

T. My good Socrates, you cannot bluff me. I tell you that almost any books will do, all the books you can get hold of; get the best out of them that can be got.

S. Quite true, Thrasymachus; but do we get good from a good thing or a bad thing?

T. From a good thing, of course.

S. And more good from that which is superior, but less from that which is inferior? And from a bad thing we can only get what is bad?

T. To be sure; what is the use of all this talk?

S. Perhaps nothing, Thrasymachus; but let us see. You have admitted that the standard books are superior to the rest?

T. I suppose I did.

S. Then more good is to be got from the standard or classical books of English literature than from the others?

T. Look here: once for all, I am Goth enough to urge, that at first it matters little what is read

so long as the habit of reading seriously and acquisitively be gained.

S. But it does matter afterwards? Or do you think that it never matters what books we read?

T. How can you ask such a foolish question, Socrates! Of course it matters whether we read Greek books or books on natural philosophy.

S. But not at first? and by that you mean in childhood and youth?

T. I do.

S. But in childhood it is said that we easily take impressions, and form habits, which afterwards are hard to change. Or do you think otherwise?

T. No; I agree with that: it is obvious.

S. Does it not matter, then, more at first than afterwards what books we read?

T. I am Goth enough to say, No, so long as the habit of reading seriously and acquisitively be gained.

S. Is not the habit of reading acquisitively the habit of keeping the impressions and the information which come from reading?

T. Yes, yes.

S. Do not be impatient, my friend; but tell me, if we read acquisitively a bad or an inferior book, the impressions which we keep must be bad or inferior?

T. Yes, and so we must avoid these books when we grow older.

S. Were we wrong, then, in admitting that the impressions made on the youthful mind are stronger and more abiding?

T. I tell you, he should browse on any books he can get hold of.

S. Is browsing, then, different from reading, or hearing, or learning?

T. Yes; it is more easy and superficial.

S. And easy and superficial reading differs from serious and acquisitive reading?

T. Why, my good fellow, they are far as the poles asunder.

S. If, therefore, a child accustoms himself to read easily and superficially, he cannot gain the habit of reading seriously and acquisitively.

T. No. But we must think more of the stuff in literature, and less of word-painting.

S. I see, Thrasymachus, that we have been forgetting the real point. It does not matter, then, how the child reads, or what he reads, but we must think of the stuff he reads. What sort of stuff ought the child to read?

T. I will tell you that easily, Socrates, if you will drop your quibbling.

S. My dear Thrasymachus, I did not mean to annoy you; but I thought that you would not mind instructing one more ignorant than yourself. However, I am all ears; speak on: I will not interrupt you, unless I do not understand; and then you will enlighten me, will you not?

T. With pleasure. Now then: you ask me what a child ought to read; I can best answer you by telling you the experience of a very great natural philosopher, Hugh Miller. He found the process of acquiring knowledge a dark one, until

his mind awoke to the meaning of the most wonderful of all stories, the story of Joseph, after which the art of reading became clear to him as the art of finding stories out of books, and the most delightful of his amusements. Then he read the other Bible stories, followed by Jack the Giant Killer and many other such stories. After this he went on to books which the learned are content to write commentaries upon, but which he found to be quite as nice children's books as any of the others. Old Homer, he found, wrote admirably for little folk, especially in the *Odyssey*, but also in the *Iliad*. He read to some purpose indeed.

S. Indeed he did; but I confess to some feeling of perplexity, for these books I thought were classical. Homer even wrote in Greek, did he not?

T. Possibly; what does it matter?

S. Nothing perhaps; but if natural philosophy has given the death-blow to Greek, children will no longer be able to read Homer's stories, will they?

T. Oh yes, they will, in English translations.

S. But if a book is translated into English, does it cease to be a classic, that is, a standard and superior book?

T. No, of course not.

S. And the Bible—is not that a classic?

T. The chief of classics.

S. And Jack the Giant Killer is a fairy-tale?

T. Yes.

S. We must have been wrong, then, to admit, as we did just now, that Greek books and fairy-tales and heathen myths and all classics are to be eschewed?

T. How you do twist my words! I never said anything of the sort. I mean, as I told you just now, that we must pay attention to the stuff which is contained in these books, and not to the style.

S. If, then, we desire to find stuff such as this in the books we read, we must choose books which contain such stuff.

T. We must, to be sure.

S. And if the child browses upon other books than those which contain this stuff, he will browse amiss?

T. He will; but he must not worry about the grammar. Hang grammar!

S. With all my heart, if it is a bad thing. But tell me, Thrasymachus, what is grammar? Is it not correctness in expression?

T. I told you that the expression does not matter one pin.

S. Not even if it be incorrect?

T. Why should it be incorrect? English books are written in correct grammar.

S. But if the grammar of a book is incorrect, is it possible to express the meaning correctly? And if the child does not understand the grammar of what he reads, when it is correct, can he understand the meaning which is intended?

T. This is quibbling again; of course the child understands.

S. I am glad of it, Thrasymachus; then he needs no teachers. But does he know where to find these stories which you wish him to read?

T. No; but he must browse on all the books he can get.

S. And if they do not contain these stories, will he find them in the books by browsing?

T. If he reads all the books he can get, he will find them.

S. But suppose the books he can get do not contain them, will he find them then?

T. Oh, he is sure to be able to get the books.

S. Very well, if you will have it so. But would he not find them sooner and more easily, if he were told where they are to be found?

T. Yes, perhaps.

S. Not perhaps, my dear Thrasymachus; I would not affirm many things as certain, but this I will affirm, that he will find them sooner and more easily, and with less waste of time and trouble. And who should tell him where these stories are to be found? For there are many books.

T. Oh, you or I, or anyone.

S. Even if we did not know ourselves?

T. Of course not, foolish man.

S. Then there should be someone who knows, to direct the child where he should look?

T. Yes.

S. And this would be the teacher?

T. If you like.

S. And if the child should not understand the grammar, or the words, or the meaning, should not the teacher explain them to him?

T. Oh, he will understand, or I am mistaken.

S. You may be mistaken, my friend; we all are sometimes mistaken. It is not sufficient, then, to let the stream of English literature flow pure and undefiled through the youthful mind?

T. I do not understand you.

S. Neither do I, and that is why I ask. But it seems that we should desire for our child a teacher who understands where the most good is to be found, and can direct the child to it, and if he needs, can explain that which needs explaining.

T. They can't do it.

SOME DEFECTS IN THE TEACHING OF HISTORY IN SCHOOLS.

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III.

IN my preceding article¹ I treated of various defects in the teaching of history due to the lack of a definite and precise *aim* on the part of the teacher, and I tried to indicate what educational purposes history, in the hands of a good teacher, may be expected to fulfil. In the case of young children, it may be employed to quicken the imagination, to widen the mental horizon, to enlarge the sympathies, to elevate the moral nature, to kindle patriotism. With pupils during the

middle years of their school career, it may be used to train the judgment, to give power in arranging and interpreting facts, to provide practice in the reading of authorities, and exercise in expression and literary style. For more advanced students it is valuable as an aid in developing the sense of civic duty, and as a means of education in that kind of research which is alone applicable to the problems of current politics, research which consists in the weighing of doubtful evidence, the balancing of conflicting authorities, the judging between antagonistic probabilities.

I must now turn to discuss briefly the questions : (ii) What historical materials are the best for the teacher to employ? (iii) What modes of teaching are the most effective.

MATERIALS.

The choice of material will be determined mainly by consideration of the age of the pupil. Children in the first stage of their educational advance will require to be lured from the narrow prison-house of their selfish preoccupation and led into the large region which lies behind the restricted horizon of their little lives by a wizardry of words to which the term "history" can be applied only in the negative sense that it connotes something which is *not* present reality. Fairy-tales from Andersen and Grimm, or from the more modern collections of Mr. Andrew Lang; stories based on the fascinating legends of the Arabian Nights; narratives of the adventures of the heroes of the Iliad, the Odyssey, the Aeneid, the Sagas—these will be the materials by means of which the historic imagination of the young child will be aroused. If he can be made to realise something of the meaning of that illusive but all-important date "once-upon-a-time," that is, if he can be made to grasp, however feebly, the idea of a remote and unfamiliar past; if he can be got to picture to himself, however monstrously, a strange and distant land, the foundation of historic knowledge will have been laid. Then may follow the exquisite stories of the Bible; after these, tales of the great men of universal history; finally, narratives, in strictly chronological order, though without definite statement of date, of the makers of English history.² We may suppose that the covering of this preliminary course of study will occupy the child until he reaches the age of ten years.

In the next period, say on the average from the tenth to the fourteenth year, more serious work will be undertaken. The worlds annexed by the childish imagination will have to be divided into two groups, the real and the unreal, or perhaps more exactly the seen and the unseen. That is to say, history proper will have to be distinguished from legendary or doubtful story. It is at this point, I think, that local history can, when it is available, be used to the greatest advantage.

¹ E.g., as told in A. R. H. Moncrieff's "Heroes of European History" (Blackie).

² Based, e.g., on Messrs. Black's series, "History in Biography," or on Prof. Church's "Stories from English History" (Seeley).

¹ See THE SCHOOL WORLD, February, 1907.

Happy the towns whose records, like those of London, York, Norwich, Bristol, Southampton, touch the national history at many points! The child who can be taken to see prehistoric implements, Roman walls, Norman castles, Gothic churches, Tudor houses; the child who can be told that through this gate such and such mighty men passed, from that quay such and such voyagers sailed, is enabled in a peculiarly easy and enduring manner to link together in the bond of verity the past of his imagination and the present of his senses. But general history taught from the local point of view is necessarily fragmentary; the fullest municipal records come into close contact but now and again with the story of the nation. The next step is to give to the rapidly developing pupil a connected and orderly view of the history of England. The whole story should be told in however scanty an outline; it is fatal to begin to pick and choose "periods" at this early stage. Mr. Townsend Warner's "Brief Survey of British History" (Blackie) gives in 250 pages a masterly summary of the complete range. Prof. Tout's "Book I." in Messrs. Longmans' Historical Series for Schools covers the same ground, and it has this advantage, that it can be supplemented at later stages by "Books II. and III.," which go over the ground again, each in fuller detail but after the same method. It is essential, however, that at this period not too much detail should be given. The great landmarks should be fixed; the leading dates ineradicably planted; the chief actors in their main *rôles* made for ever familiar.

I am inclined to hold that it is well during this second stage of the pupil's educational career not to wander beyond the confines of British history except in so far as it is necessary to do so in order to make British history intelligible. Perhaps, however, in some cases, towards the end of the period, some such book as Miss Wilmot-Buxton's "Makers of Europe" (Methuen), or Mr. M'Dougall's "Landmarks of European History" (Blackie), or Mr. Dixon's "Main Landmarks of European History" (Clive), might with profit be read. But it is in the final stage of the ordinary school course, say from the age of fourteen to the age of seventeen, that general European history has its proper place. It is far too complex to be understood at all adequately at any earlier point. In this final stage the study of history will make large demands upon the time and the thought of the pupil. It will also imperatively call for the skill and the undivided attention of a specialist teacher. No form-master or form-mistress can be expected, among the multiplicity of class duties, to acquire the knowledge or devote the care required for the successful employment of history as an instrument of education when pupils get beyond the elementary steps. First, English and imperial history will have to be reviewed in detail with increasing attention to its constitutional, economic, and international aspects. "Source-books"¹ will be brought into requisition; books of "Illus-

trative History"¹ will be used; the classics of English historical literature will be drawn upon;² the resources of the school library will be brought to bear.

Then, as a wider realisation of the meaning of history is gained by the pupil, he will be led on to what may be regarded (so far as subject-matter is concerned) as the goal of his historical education in school, a knowledge of the great movements of humanity, as a whole, commonly called the outlines of general history. Using such a book as Dr. G. B. Adams's "European History" (Macmillan) as a text-book, he will study the development of Greece and Rome, the course of the barbarian settlements, the formation of the nations, the conflicts between the Crescent and the Cross, the movements of the Renaissance and the Reformation, the voyages of exploration and discovery, the evolution of Modern Europe and the New World.

METHODS OF TEACHING.

As in the case of materials, so in the case of methods of teaching, the age of the pupil is the grand determinant. Among the defects of method noted by inspectors and others are slavish adherence to a single text-book and excessive employment of the lecture form of instruction. Yet both text-book and lecture have places in a properly graduated scheme of instruction; for a pupil in the mid-period of his school course a text-book cannot without irreparable loss be dispensed with; for advanced students an occasional lecture is of the highest value in stimulating thought, in summarising results, in opening up new fields of ideas. In the case of young children an oral method is, of course, the only one which can be employed. It is the task of the teacher—and a peculiarly enviable one—to tell by word of mouth to quick and eager ears the wonders of legendary lore. How intensely do some of us, as we advance in years, wish that we could hear for the first time and with the old zest the tales of Hector, and Perseus, and Aladdin! Our wish cannot be gratified; but there remains to us inalienably and for all our lives the hardly inferior joy of telling to new generations of children the old stories that open to them, as they did long ago to ourselves, the gates of fairyland. But even when the fairy-tale stage is past, oral teaching will for a long time remain the staple method of instruction. It is well for the teacher to go over a lesson point by point with his class before it is "set" for home-work. When it has been studied, it is essential that by a judicious system of questioning and by a sympathetic encouragement of questions on the part of the pupil his knowledge should be tested, his erroneous ideas corrected, his imperfect information supplemented. The clearest and most lucid text-book contains terms and phrases unintelligible to the child-mind and liable to serious and even ludicrous

¹ E.g., the series issued by Messrs. Horace Marshall and Son, or the materials collected in Traill's "Social England."

² E.g., the admirable and inexpensive "English School Texts," edited by Dr. Rouse (Blackie). Mr. Edward Arnold publishes a useful series, "Gateways to History," with companion volumes on literature and geography, by means of which the task of co-ordination is much simplified.

¹ See list given in Leaflet No. 1 issued by the Historical Association, 6, South Square, Gray's Inn, London.

misinterpretation. One feels, for example, that the boy who defined a Papal bull as "a peculiar kind of cow, found in Italy, which does not give milk," had received insufficient oral instruction. In short, however good a text-book may be, it remains inarticulate, almost inanimate, except in so far as the living voice and enthusiastic spirit of the teacher kindle it into vitality and reality.

The modern teacher, especially if he be fortunate enough to be able to devote the whole or the major part of his time and attention to history, will find many valuable aids provided for him. Such a "source-book" as that of Miss Kendall (Macmillan) will supply him with most vivid and interesting contemporary narratives of the leading events in English history. The school library should furnish him with the potent assistance of the standard historical novels, which, as Carlyle said, will do much to make the pupils realise that "the bygone ages of the world were actually filled by living men, not by protocols, state papers, controversies, and abstractions of men."¹ He will not find it so easy to get hold of good historical maps for class purposes. The Navy League (13, Victoria Street, London, S.W.) issues an excellent map of the British Empire; but for the rest he will probably discover, as I for my own part have done, that it is necessary to make his own. It is astonishing that no enterprising firm of cartographers has issued a series of maps to illustrate English history. History cannot be taught apart from geography; neither subject can be taught without maps. Probably the best plan available at present is to take Dr. Gardiner's atlas (Longmans), trace the main outlines of the map required (omitting everything save the most prominent features), then rule the tracing into squares and reproduce it square by square on canvas. A sufficiently accurate map is thus obtained with little trouble or expense; the map should, if possible, be coloured.

A further useful adjunct to the teaching of history is the "Time Chart," described fully by the late Prof. Withers.² It does for time what maps and diagrams do for space; it brings the eye to the help of the imagination in realising the continuity of history and the duration of eras. Finally, a large number of historical pictures, photographs of the portraits of historical personages, and reproductions in facsimile of historic documents are now available for use in schools. There can be no doubt that if they are judiciously used, that is to say, if they are kept in proper subordination to the main and serious business of the lesson, they render service in keeping up interest and in lending reality.

By these means, and by others which will suggest themselves to the skilled and earnest teacher, some of the present defects in the teaching of history will be removed, and history will more and more surely take its proper place in the front rank of the subjects comprised in the curriculum of a liberal education.

¹ See Mr. Jonathan Nield's "Guide to the Best Historical Novels and Tales" (Elkin Mathews).

² Barnett's "Teaching and Organisation" (Cambridge Univ. Press), p. 192.

PARAPHRASING IN PRACTICE.

By NORMAN L. FRAZER, M.A.

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II.

In the last article¹ it was shown how the elements of the art of paraphrase might be taught by restricting the reading to a few selected authors. In the present article we have to consider the next stage in the pupil's development, and instead of naming authors specially suitable from our present limited point of view, we shall refer as far as possible to types of literature which we think should be normally read at this stage and which will now best afford the requisite training.

Narrative poetry will still be largely read, but if it be at the same time didactic or semi-didactic, the horizon of paraphrase will be perceptibly widened; for we shall be making an easy transition from the concrete to the abstract, and be approaching the realms of fancy by the path of reasoning. If we may venture, after all, to mention names, we should say that Goldsmith will be found to mark the type we have been trying to indicate, as the following passage may show.

Thus every good his native wilds impart
Imprints the patriot passion on his heart ;
And e'en those ills, that round his mansion rise,
Enhance the bliss his scanty fund supplies.
Dear is that shed to which his soul conforms,
And dear that hill which lifts him to the storms ;
And as a child, when scaring sounds molest,
Clings close and closer to the mother's breast,
So the loud torrent, and the whirlwind's roar,
But bind him to his native mountains more.

It will be seen here that there is no real difficulty of language, and that the general sense is perfectly clear; but the vein of moralising runs through it and seems to the young pupil to be teeming with unseen difficulties. The epithets are not numerous, but even where they are in form more or less conventional they are by no means otiose. The simple metaphor which concludes the passage will demand just that amount of skill for its neat rendering into prose which may be required from candidates of the junior grade.

If it is desired—as it must be desired—to continue reading which will give a special training in literary allusion, the only difficulty will arise from embarrassment of choice. But we think that the best author for our purpose at this stage will be found in Byron, for in addition to the wealth of his allusions we shall have the added advantage, from our present point of view, of his diffuseness and faulty constructions. Two stanzas from the "Ode to Napoleon" will aptly serve as a type of exercise, where the thought is expressed so epigrammatically that, although the meaning is lucidly clear, the necessary expansion involves considerable care.

The Spaniard, when the lust of sway
Had lost its quickening spell,
Cast crowns for rosaries away,
An empire for a cell;
A strict accountant of his beads,
A subtle disputant on creeds,
His dote trifled well:
Yet better had he neither known
A bigot's shrine, nor despot's throne.

* * * * *
But thou, forsooth, must be a king,
And don the purple vest!
As if that foolish robe could wring
Remembrance from thy breast.
Where is that faded garment? where
The gewgaws thou wert fond to wear,
The star, the string, the crest?
Vain foward child of empire! say,
Are all thy playthings snatch'd away?

Pastoral poetry will be found very useful at this stage, because it presents a picture of natural scenes in idyllic language; simile, metaphor, and ornate epithet will abound, and these always must form the very backbone of the difficulty of paraphrase. The preservation of vocabulary is easily obtained by requiring, for instance, a description of the landscape in "L'Allegro," while a more formal and equally valuable exercise is provided by paraphrasing such a passage as this from the same poem:

Straight mine eye hath caught new pleasures,
Whilst the landscape round it measures;
Russet lawns, and fallows gray,
Where the nibbling flocks do stray;
Mountains, on whose barren breast
The labouring clouds do often rest;
Meadows trim with daisies pied,
Shallow brooks, and rivers wide:
Towers and battlements it sees
Bosom'd high in tufted trees,
Where perhaps some beauty lies,
The cynosure of neighbouring eyes.

The great use of reading Shakespeare's historical plays is too obvious to require more than passing comment, and examination schedules will keep the fact sufficiently before our notice.

So far we have said nothing of the use of prose in the teaching of paraphrase. In the preliminary stage, indeed, it must be recognised that absolute simplicity in prose is so essential that paraphrasing has no place; but now, when authors must be presented to the pupil in their own proper dress and order, much useful study in the choice of words, the sequence of ideas, and the connotation of terms may be based upon a reasonable use of paraphrase. The difficulties, however, and in a sense the precise object in view will be different, for the very fact that prose order has been substituted for poetic form will have removed one great stumbling-block from the young pupil's path. And yet the diction, although, possibly, not poetic or even archaic, may be so literary in character as to seem a new and strange tongue to the junior candidate. He will

probably do best by making a start with some simpler passages from Macaulay, such, for instance, as are to be found in the "Lives of Goldsmith and Johnson." The constructions will be comparatively clear, and the language will be such as to give him unbounded practice in the collation of "so-called synonyms." As suitable examples of such passages we cite one from each of the books just mentioned.

In "The Traveller," the execution, though deserving of much praise, is far inferior to the design. No philosophical poem, ancient or modern, has a plan so noble, and at the same time so simple. An English wanderer, seated on a crag among the Alps, near the point where three great countries meet, looks down on the boundless prospect, reviews his long pilgrimage, recalls the varieties of scenery, of climate, of government, of religion, of national character, which he has observed, and comes to the conclusion, just or unjust, that our happiness depends little on political institutions, and much on the temper and regulation of our own minds.

We may observe in passing that not the least valuable part of the paraphrasing of such simple prose exercises lies in the fact that a considerable portion of them needs no paraphrasing at all.

The other passage is a trifle more difficult, only because the vocabulary is slightly more latinised.

Johnson saw with more envy than became so great a man the villa, the plate, the china, the Brussels carpet, which the little mimic had got by repeating, with grimaces and gesticulations, what wiser men had written; and the exquisitely sensitive vanity of Garrick was galled by the thought that while all the rest of the world was applauding him, he could obtain from one morose cynic, whose opinion it was impossible to despise, scarcely any compliment not acidulated with scorn. Yet the two Lichfield men had so many early recollections in common, and sympathised with each other on so many points on which they sympathised with nobody else in the vast population of the capital, that though the master was often provoked by the monkey-like impertinence of the pupil, and the pupil by the bearish rudeness of the master, they remained friends till they were parted by death.

Following the plan of our previous article we shall now give a number of types of questions which can be made to fit any piece of the literature the form happens to be reading, and which in our opinion are helpful and, indeed, necessary mechanical aids to paraphrase proper.

(1) Deduce the meanings of the following words from the following additional instances of their use. [Note.—An excellent instance of this type of question is to be found in the questions appended by Mr. C. T. Onions to the Carmelite edition of "The Deserted Village."]

(2) Analyse this poem into its different parts, noticing especially the transitions from one theme to another. [Note.—Very suitable poems at this stage are Milton's pastorals.]

(3) Write an essay on "National Character," basing your remarks on "The Traveller."

(4) Collect instances in the author being read of mixed metaphor.

(5) Expand with historical particularisation the following passage. [Note.—Many poems will provide such material, notably "The Traveller," "Lycidas," Milton's "Sonnets," and a great deal of Byron.]

(6) Explain, and contrast with modern use if necessary, the following words. [Note.—Such common eighteenth-century uses as vulgar, pretend, reign, nice wit, sick, &c., will occur to everyone.]

(7) What expressions in this poem have become proverbial in the language?

(8) Write out in prose order the following lines.

(9) Trace the sequence of thought in Gray's "Elegy" or Shelley's "Ode to a Skylark."

(10) Give in your own words the substance of Antony's oration in the Forum, so as to show how he gradually leads up to his real purpose.

We conclude by offering a few selections of passages, mostly taken from recent Local (Junior) examinations.

(1) Give the full meaning of the following passage in simple prose:

(a) A dearer merit, not so deep a maim
As to be cast forth in the common air,
Have I deserved at your highness' hands.
The language I have learn'd these forty years,
My native English, now I must forgo:
And now my tongue's use is to me no more
Than an unstrunged viol or a harp;
Or like a cunning instrument cased up,
Or, being open, put into his hands
That knows no touch to tune the harmony.

(Shakespeare, *Rich. II.*)

(b) I could not stay behind you: my desire,
More sharp than filed steel, did spur me forth;
And not all love to see you,—though so much
As might have drawn one to a longer voyage,—
But jealousy what might befall your travel,
Being skilless in these parts; which to a stranger,
Unguided and unfriended, often prove
Rough and unhospitable: my willing love,
The rather by these arguments of fear,
Set forth in your pursuit.

(Shakespeare, *Twelfth Night.*)

(2) Rewrite in your own words:

(a) No, not an oath: if not the face of men,
The sufferance of our souls, the time's abuse,—
If these be motives weak, break off betimes,
And every man hence to his idle bed;
So let high-sighted tyranny range on,
Till each man drop by lottery. But if these,
As I am sure they do, bear fire enough
To kindle cowards and to steel with valour
The melting spirits of women, then, countrymen,
What need we any spur but our own cause,
To prick us to redress? What other bond
Than secret Romans, that have spoke the word,
And will not palter? and what other oath
Than honesty to honesty engaged,
That this shall be, or we will fall for it?

(Shakespeare, *Julius Caesar.*)

(b) Gay hope is theirs by fancy fed,
Less pleasing when possest;
The tear forgot as soon as shed,
The sunshine of the breast:
Their buxom health of rosy hue,
Wild wit, invention ever-new,
And lively cheer of vigour born;
The thoughtless day, the easy night,
The spirits pure, the slumbers light,
That fly th' approach of morn.

* * * * *

Alas! regardless of their doom
The little victims play;
No sense have they of ills to come,
Nor care beyond to-day:
Yet see, how all around 'em wait
The ministers of human fate
And black Misfortune's baleful train!
Ah, show them where in ambush stand,
To seize their prey, the murderous band!
Ah, tell them they are men!

(Gray, *Eton Ode.*)

THE STUDY OF THE LIVING PLANT.¹

SIMPLE EXPERIMENTS FOR "PRELIMINARY CERTIFICATE" STUDENTS.

By E. STENHOUSE, B.Sc. (Lond.),
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III.

THE FLOWER OF PLANTS OF THE BEAN ORDER.—Examine flowers of the bean or of the sweet pea, vetch, lupin, bird's-foot trefoil (Fig. 1), laburnum, gorse, &c., and notice the "butterfly" - shape formed by the coloured leaves (*petals*) in this order of plants. Observe the arrangement of the petals to form (a) the large, upper *standard*, (b) the two *wings* at the sides, and (c) the boat-like *keel* of two united petals. The five petals together constitute the *corolla*. Outside the petals, and covering their bases, observe the green cup-shaped *calyx* of five united *sepals*. Are the sepals placed opposite the petals, or in the intervals between the petals? Take off the petals, one at a time, noticing carefully the peculiar joint at the base of each wing. The ten stamens are now visible. Each is composed of a fine stalk (*filament*), carrying a two-lobed knob (*anther*), the latter being, in a fully-opened flower, covered with minute grains (*pollen grains*) readily adhering to any object touching it. In the laburnum, gorse, and a few others, the filaments of all ten stamens cohere to form a tube. In most plants of this order, one stamen—opposite the standard—is entirely free from the other nine, which are united. In these cases a chink is left in the tube of united filaments. Lay open the tube with a needle or knife-point. Observe the elongated body (*pistil*) thus wholly exposed, but before examining it look for a small drop of liquid (*nectar*) at the base of the filament tube. Taste the nectar. Examine the pistil. Make out the terminal knob

¹ Th: previous articles appeared in January and February, 1907.

(*stigma*), the neck-like *style*, and the swollen *ovary*; the *ovary* is the only part enclosed by the *filament tube*. Open the *ovary* and observe the small grains (*ovules*) arranged along its length.

FERTILISATION.—In order that an *ovule* may become a seed, its contents must mix with the contents of a pollen grain. The fusion of the two constitutes fertilisation. For fertilisation to take place, the pollen grain must first of all gain access to the *stigma* of the *pistil*. A sugary solution on the *stigma* stimulates the pollen grains to growth, and each puts out a long tube which grows down the *style*. The living matter of the grains keeps near the tips of the tubes as these continue their journey down the *style*. At length the tubes enter the *ovary* and find the *ovules*. Each *ovule* has at one end a minute pore (the *micropyle*), and a pollen tube finds this and enters it. The living matter of the pollen tube fuses with that of the *ovule* in the neighbourhood of this pore, and fertilisation is effected.

CROSS FERTILISATION.—Botanists have proved

that in the majority of cases a flower produces more and also stronger seeds when the *ovules* are fertilised by pollen from another flower of the same species.

Watch bees visiting pea, bean, and lupin flowers. Notice that the insect stands on the wings, which are depressed by its weight,

and in their turn force down the keel also. This causes the *stigma* and *anthers* to be protruded, and to come in contact with the bee's body. Imitate the process by pressing down the wings of another flower with the fingers, and carefully observe the order in which the *stigma* and *anthers* appear. Does this order in any way make it probable that a bee—visiting several flowers of the same kind in succession—will cross-pollinate the flowers, that is, transfer the pollen of one flower to the *stigma* of another? If so, how?

It is known that bees make honey from the nectar they obtain from flowers. How do the bees find the flowers? On a warm, sunny day carefully remove the petals from a number of flowers, so as to avoid damaging any other part, and watch to see if these flowers—thus rendered inconspicuous, but still possessing nectar—are overlooked by bees visiting complete flowers on the same plant. What is evidently one use of showy petals?

Make a list of twenty or more common flowers, and state in each case whether the flower is con-

spicuous or inconspicuous (by reason of coloration or situation), strongly scented, faintly scented; or scentless; and try to discover if there is any relation between conspicuousness and the presence or absence of scent.

Notice that in the bud stage the other parts of the flower are covered and protected by the calyx. Write down a list of the duties (functions) of calyx, corolla, stamens, and pistil.

Notice that insects rarely visit flowers which are neither conspicuous nor scented. Such flowers—e.g., those of grasses (Fig. 2) and of most of our forest trees (Fig. 4)—are generally pollinated by the wind. Examine as many flowers of this character as possible, and notice that an abundance of pollen is produced, and that the *stigmas* are branched, spreading, or feathery, in order to catch the wind-borne pollen grains more readily.

Cover with muslin, stretched on wire frames, unopened flowers of species regularly pollinated by insects, so as to exclude these animals; but in



FIG. 1.—Bird's-foot trefoil. 1, flowering branch (x 4); 2, flower; 3, pistil and stamens; 4, pistil (x 13); 5, fruit (x 4); 6, corolla; a, standard; b, wings; c, keel; 7, diagram of flower.

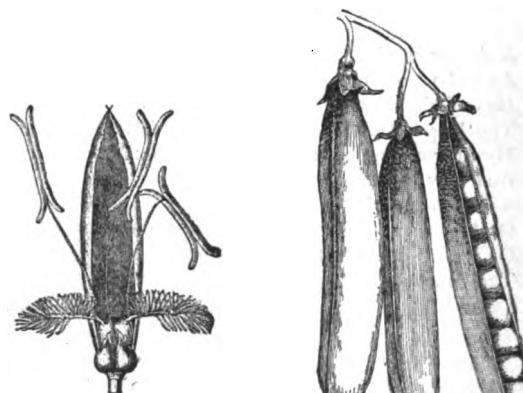


FIG. 2.—A flower of meadow fescue grass, partly dissected to show the three stamens and the two feathery stigmas (x 6).

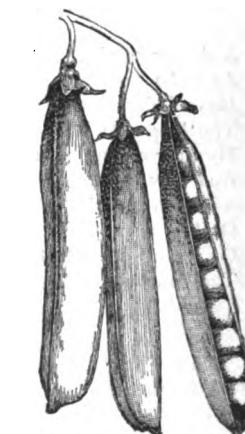


FIG. 3.—Pods and seeds of garden pea.

all other respects allow the plants to grow naturally. Notice whether such covered flowers produce seeds. Primrose and red clover usually give good results with this experiment.

Many other flowers (e.g., wallflower), treated in this way, still produce seeds, showing that if cross-pollination should fail, they resort to self-fertilisation as better than none. Cut off the *anthers* of wallflower blossoms before they discharge the pollen (in order to do this it will be necessary to open the buds artificially), and cover the flowers so treated with muslin bags, thus ensuring that no pollen, from either the same or another flower, can reach the *stigma*. Notice that such a flower does not ripen seeds.

Cut off the *stigmas* of other flowers before they have been pollinated, and notice that these flowers also fail to ripen seed.

FORMATION OF FRUIT.—Observe in normal flowers, that after fertilisation the stamens, petals, and (usually) sepals drop off, and the *ovary* gradually changes into a fruit as the contained *ovules* gradually change into seeds.

DISTRIBUTION OF SEEDS.—Leave fruits (pods) of bean, pea (Fig. 3), lupin, laburnum, bird's-foot trefoil, &c., on the plants until they open of themselves, and describe any means by which the scattering of the seeds is effected in any of these plants. The method adopted by the bird's-foot trefoil is especially worthy of study.

Study the part played by the wind in scattering (a) the plumed fruits and seeds of dandelion, thistle, willow, willow-herb, &c.; (b) the winged fruits and seeds of sycamore, elm (Fig. 4), ash, pine, &c.

Observe how such hooked fruits as those of herb-bennet, wood avens (Fig. 5), goosegrass (cleavers), and various "burrs" stick to the clothing; and hence deduce the unconscious agency of sheep and other grazing animals in dispersing the seeds of such plants.

Make a list of brightly coloured fruits (e.g., Fig. 6), and notice that in practically all cases part of the fruit is juicy, and is relished as food by



FIG. 4.—The elm; leaves, flowers, and fruit. 1, flowering branch ($\times \frac{1}{2}$); 2, branch with leaves; 3, a flower ($\times 2$); 4, the same, cut through longitudinally; 5, a fruit ($\times \frac{1}{2}$).

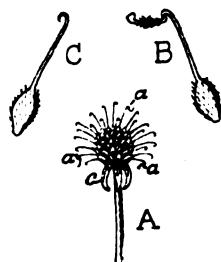


FIG. 5.—A, head of fruits of wood avens ($\times 1$); B and C, single fruits ($\times 2$); a, a flower ($\times 2$); 5, a fruit ($\times \frac{1}{2}$).

birds or other animals. Examine the seeds of such fruits, and describe any peculiarities which would either prevent them from being eaten with the juicy pulp, or would, in the event of their being eaten, prevent them from being harmed by the animal's digestive juices.

Make a list of the advantages which the next generation of plants owes to the distribution of the seeds formed by the last generation.

DEATH AND DECAY.—Leave in the ground some well-grown annual plant (e.g., sunflower) after flowering, and observe the various stages of its decay and almost entire disappearance during the winter. In damp, close weather, carefully examine such dead plants for signs of moulds.

Take three ripe apples. Remove a small piece of the skin from one; do the same with a second, and rub on the wound a pinch of dust from a shelf; allow the third to remain intact; then lay them aside for several weeks. Examine them at intervals, and notice the order in which they decay.

MOULDS AND OTHER FUNGI.—On which of the three apples do moulds first begin to grow? How did the moulds gain access to the apples? Is the decay of the apples hastened, or is it retarded, by the presence of moulds? In what places have you seen moulds, mushrooms, toadstools, or other fungi growing? Have you ever seen fungi growing in a place where there was no decaying organic matter? Have you ever seen moulds or other fungi growing on decaying animal matter?

Do fungi show any preference for well-lighted situations, or do they seem indifferent to light? Notice that fungi differ from higher plants in not possessing green colouring matter (chlorophyll). Recall the use of chlorophyll to green plants. Try to explain why fungi cannot grow except where they can obtain a supply of organic food. What useful part is evidently played by fungi? What would be one result of the sudden extinction of all fungi?

Make observations on the work done by insects in clearing away decaying organic matter, and compile a list of those you have seen engaged in such work.

THE STRUGGLE FOR EXISTENCE.—It will be remembered that, for ordinary green plants, the primary conditions of obtaining food are soil-water, air, light, and the presence of chlorophyll. The food is for the most part built up in the leaves, which are green, are exposed to the light and air, and are supplied, through the stem, with soil-water taken in by the roots. The leaves not only manufacture the food, but they are also responsible for getting rid of excess moisture by transpiration, and for supplying the plant with a considerable amount of the oxygen it requires for breathing. From these considerations, it is to be expected that in the forms and arrangement of the leaves will be found the most striking of the modifications whereby plants compete with their neighbours for the necessities of life.

The intensity of this competition will be brought home to the mind of the student if he reflect that each year many of the commonest plants in our fields produce thousands of seeds, of which only one can, in general, survive to take the place of the parent.

GRASS-LIKE PLANTS.—Make a list—from personal observation in the field—of plants which bear long, narrow, and flexible leaves (Fig. 7), like those of grasses, or finely divided leaves which are



FIG. 6.—Holly. The red colour of the fruit contrasts strongly with the dark green of the leaves.

able to compete with grass leaves for the available sunlight and air. The list may be started with, e.g., the buttercup, ox-eye daisy, &c.

ROSETTE-FORMING PLANTS.—Make a list of plants which "stake out a claim" with a rosette of leaves pressed closely to the ground, and so appropriate a certain area to their own exclusive use. Observe in such cases (e.g., field daisy), the narrowness of the base of the leaf, preventing wasteful overlapping.

ECONOMY OF LEAF-SURFACE.—Notice, as another example of economy of leaf-surface, the manner in which ivy leaves, growing close together, arrange themselves so that a point on one leaf will, if possible, fit into an indentation of a neighbouring leaf, and so produce a "leaf mosaic." Look for other examples.

CREEPING PLANTS.—Make a list of plants which are found to creep along the ground or below the surface, and send up leafy shoots at intervals. What advantages have such plants over those

which do not travel horizontally?

CLIMBING PLANTS.—Make a list of plants, themselves too weak to stand erect, which climb up stronger plants or other supports, in order to spread out their leaves to the light and air. A hedge affords the most instructive conditions for this observation. Notice in each case the method of climbing: e.g., by hooks, tendrils, adhesive roots, or twining stems or leaf-

stalks. In such plants observe the scarcity of leaves and the length of the internodes in the lower parts of the stem, where light and air are difficultly obtainable.

TREES AND SHRUBS.—Finally, observe that in the case of trees and shrubs, which have persistent woody stems and branches, the plants, once started, are able to outdistance their herbaceous rivals, and have to compete only with other trees and shrubs. Notice how oaks, growing close together in a wood or plantation, develop tall and straight trunks in their efforts to raise their leaves to the light and air; while solitary oaks (Fig. 8) have generally gnarled and irregular trunks and branches.

PLANTS GROWING IN WATER.—Examine common water-plants. Notice that submerged leaves (e.g., of water crowfoot) are often finely divided, in order to lessen the strain of friction of the water. Floating leaves, on the other hand (e.g., water-lily), are entire. If possible, cut open the stem, and notice the almost entire absence of supporting and strengthening tissue, which the buoyancy

of the water renders unnecessary. The buoyancy is increased by the development of abundant air-spaces.

PLANTS IN DRY SITUATIONS.—It is obvious that plants the roots of which are unable to obtain much water are in danger of becoming too dry unless their leaves are modified to reduce the transpiration (loss of water) taking place through the stomata. Bearing in mind that the stomata are usually on the lower surface, examine such moorland plants as ling, crowberry, cranberry, cross-leaved heath, &c., and try to discover how the peculiarities of their leaves tend to lessen transpiration.

PLANTS EXPOSED TO COLD.—During the winter, and also in exposed situations, the roots of plants are often too much chilled to be able to absorb water freely. The danger of continued transpiration by the leaves in such cases is obvious. Notice devices to prevent this: e.g., (a) the loss of the leaves of most forest trees in winter; (b) the tough-

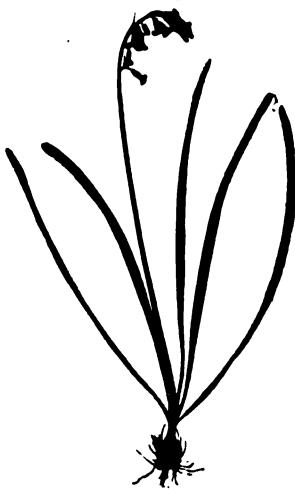


FIG. 7.—Wild hyacinth ($\times \frac{1}{2}$).



FIG. 8.—A solitary oak.

ness, smallness, or reduction, by various means, of the free transpiration-surface. Write notes on the peculiarities in this respect of the leaves of rushes, furze, pines, rhododendrons, holly, &c. Why is it a mistake to water plants when a very cold night may be expected?

PLANTS EXPOSED TO SALT WATER.—It will be understood (see Article II., February, 1907) that the presence of much salt in the soil will interfere with absorption of soil-water by osmosis. Examine plants on the seashore for woolly leaves, thick leaf-skins, succulent leaves, or other devices for diminishing transpiration.

STORAGE OF FOOD.—In winter examine the "bulbs" (better called corms) of crocus, the bulbs of snowdrop, hyacinth (Fig. 7), &c., the tubers of potato (Fig. 9) and Jerusalem artichoke, the tuberous roots of dahlia, conical roots of carrot, &c., the underground stem of Solomon's seal, and observe how these parts are swollen with stored food. Cut them across, and test for starch with iodine solution. Make a list of (a) those which

contain starch, and (b) those in which the stored food is evidently devoid of starch.



FIG. 9.—Part of a potato plant, showing the old tuber (dark) and several new ones ($\times 1\frac{1}{2}$).

How many of these plants flower very early in the spring? Try to explain the importance of stored food, (a) to early-flowering plants, (b) to *biennials* (plants which complete their life-history in two years), and (c) to such *perennials* (plants living for an indefinite number of years) as become dormant in the winter.

Why do *annuals* (plants whose life-history is completed in one year) not need to store food?

THE METRIC SYSTEM.

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II.—CONVERSION AND CALCULATION.

ENTHUSIASTS for the metric system, if asked for a few hints on methods of teaching how to convert measures from the French to the British system, would feel inclined to echo the immortal jibe of Mr. Punch in his advice to those about to marry: "Don't."

Schoolmasters, however, not less than other men, are creatures of environment, and compelled to adopt many systems which they might happily dispense with in a perfect state. We do not, indeed, suggest that there is any real resemblance between metres and monasteries, or between miles and matrimony, further than that the consideration of the latter should be reserved for those of more mature age than the average schoolboy.

On the contrary, whilst the schoolmaster would welcome the removal of the cruel disability under which his noble profession labours with regard to the matter which Mr. Punch satirises, the teachers of mathematics and science would rejoice to see the whole British system of units banished from the school curriculum.

These obnoxious measures—troy weight, apothecaries' weight, and avoirdupois weight, yards and ells, poles and square poles, geographical miles and nautical miles, gallons, pecks, and bushels, not to mention coombs or carats, lines or leagues, hogsheads, or other hideous terms—have gone from the laboratory, are going from the market-place, and must go from the schoolroom.

This, of course, is a counsel of perfection. We must not altogether leave out of consideration parents, examiners, literature, trade, or even the innate conservatism of the man-in-the-street. We all know how long the "guinea" has survived in England, and how the "sou" still lingers in France. We cannot by any government decree prevent the average man from continuing to think in miles, acres, or feet; nor can we preclude mothers from talking to their children about

ounces, yards, and pints. So long as the home influence is on the side of the British units, so long must our strongest appeal to the young mind be found in these appalling measures.

Our only hope for the future of education, for the supremacy of our commerce, and for the ultimate release of our children from the thraldom of dreary tables, lies in teaching them to think with equal clearness both in the metric system and in the most popular of the British units.

That is the sole excuse which can be offered for the following remarks; because we cannot regard as a convincing argument the plea that these units provide a valuable intellectual exercise. No doubt they form a species of mental gymnastic; but if its value depends upon the inconvenience of the units, then the worse the system the more it should be perpetuated. On the other hand, if mere change from the simplicity of the metric system be demanded, this can easily be found. As the British measures are gradually dropped out of the course, we may introduce one by one the ever-increasingly important physical and chemical units, which will provide all the mental stimulus of the kind that can be desired.

We shall assume, therefore, that for the present, at least, some knowledge of the following units is essential, viz., the inch, foot, yard, and mile; the grain, ounce, pound, hundredweight, and ton; the pint, quart, and gallon; and, for land measurement, the acre and the chain.

The pupils can easily see that four inches and ten centimetres are nearly equal. Questions should be set in the following form:

"If 4 in. = 10 cm., how many centimetres are there in 15 inches? Also, how many inches are there in 17 centimetres?"

Do not let the pupils acquire a habit of saying: "Multiply by 2·5 to reduce inches to centimetres, and divide by 2·5 to reduce centimetres to inches." Make them write out their work thus:

$$\begin{array}{ll} 4 \text{ in.} = 10 \text{ cm.} & 10 \text{ cm.} = 4 \text{ in.} \\ \therefore 1 \text{ in.} = 2\frac{1}{2} \text{ cm.} & \therefore 1 \text{ cm.} = 0\cdot4 \text{ in.} \\ \therefore 15 \text{ in.} = 2\frac{1}{2} \text{ cm.} \times 15 & \therefore 17 \text{ cm.} = 0\cdot4 \text{ in.} \times 17 \\ & = 37\frac{1}{2} \text{ cm.} & = 6\frac{1}{2} \text{ in.} \end{array}$$

Follow these questions by others of the type: "If 4 in. = 10 cm., express 5 metres in feet, and reduce 0·35 in. to millimetres."

Next let them measure the number of centimetres in 10 inches. Then set questions similar to the preceding, and also such as this:

"If 10 in. = 25·4 cm., find the difference between 12 yards and 11 metres."

$$\text{We have } 1 \text{ in.} = 2\frac{1}{2} \text{ cm.}$$

$$\therefore 1 \text{ yd.} = 2\frac{1}{2} \text{ cm.} \times 36$$

$$\therefore 12 \text{ yd.} = 2\frac{1}{2} \text{ cm.} \times 36 \times 12$$

$$= 1097\frac{1}{2} \text{ cm.}$$

$$\text{Also } 1 \text{ m.} = 100\text{cm.}$$

$$\therefore \text{reqd. diffce.} = 2\frac{1}{2} \text{ cm.} = 3 \text{ cm. approx.}$$

We might now state that the legal equivalent of the metre as established in 1897 is 39·370113 inches. We could use this as follows:

"Is it more correct to say that 1 m.=39.37 in., or that 1 in.=2.54 cm.?"

If 2.54 cm.=1 in.

$$\text{then } 1 \text{ cm.} = 1 \text{ in.} \times \frac{1}{2.54}$$

$$= 0.39370078 \text{ in. (nearly).}$$

Thus 1 m.=39.370078 in.

This shows an error=0.000035 in.

The other shows an error=0.000113 in.

Thus "1 in.=2.54 cm." is the more accurate statement.

We might then suggest that probably in the future it will not often be necessary to convert metres into British units, but that we may have to perform the converse operation when referring to books printed in the older system. Hence for practical purposes the statement "1 in.=2.54 cm." is not only more accurate, but also more useful than "1 m.=39.37 in."

It should be pointed out that a clearer way of stating the equation is "1 in.=2.54000 cm.", since, from the legal equivalent, we can calculate that "1 in.=2.539998... cm."

It is noteworthy that the error in reducing British lengths to the metric system, or vice versa, by means of the simple formula "1 in.=2.54 cm." is less than one per million. (Two per million for area; three per million for volume.) Why do our text-books continue to worry us with obsolete numbers like 39.37079? And why could not the Board of Trade adopt the simple figures 2.54?

Using these figures, the class can find that 1 foot=30.480 cm., 1 yard=0.91440 m., and 1 mile=1.6093 km.

Associated with the above work should be plenty of oral exercises in conversion by means of the formulæ "4 in.=10 cm." and "12 yd.=11 m." For the latter statement we may substitute, "The difference between the measures of a length in yards and in metres is about a tenth of the whole." This, of course, is rough, and would convert 1609 m. into 1770 yd. (instead of 1 mile). But it has a decided advantage for the purpose of such questions as "How many metres are there in 100 yards? How many yards in a kilometre?", and, after all, the error is little more than $\frac{1}{2}$ per cent.

The pupils can now find that there are about 8046 m. in five miles, and thus obtain "5 ml.=8 km.," which will provide additional oral exercises. It should be noted that this formula is of the same order of roughness as the previous statement, since both methods would convert 1 km. into 1,100 yd.

In dealing with area and volume pupils should be discouraged from quoting "144 sq. in.=1 sq. ft.," "27 cu. ft.=1 cu. yd.," or "10,000 sq. cm.=1 sq. m.,"—a form which disguises the underlying principles. "12² in.²=1 ft.²," "3² ft.²=1 yd.²," and "100² cm.²=1 m.²," or even "12² sq. in.=1 sq. ft.," &c., are much better.

In a question of the following type it is painful to see such work as this:

"If 1 m.=39.37 in., how many cubic feet are there in a cubic metre?"

Since 1 m.=39.37 in.

(Here follows an elaborate process of cubing 39.37, in which, probably, either too many figures are retained or too many rejected.)

$$\therefore 1 \text{ cu. m.}=61,024 \text{ cu. in.}$$

(Here follows a piece of long division by 1,728, or perhaps three successive divisions by 12 with redundant or insufficient figures.)

$$\therefore 1 \text{ cu. m.}=35.31\dots \text{ cu. ft.}$$

Such work usually bristles with errors. In many cases a slight error in cubing renders all that follows useless. Some fail in the division: one of the commonest mistakes is to write 1,760 for 1,728; whilst others quote 27 or 144 as the number of cubic inches in a cubic foot.

On the contrary, if they were accustomed to say "12 in.³=1 ft.³," it would hardly be possible for them to make such an anomalous statement as "12² in.³=1 ft.³"; and the above work would probably be arranged as follows:

$$1 \text{ m.}^3=(39.37)^3 \text{ in.}^3=\left(\frac{39.37}{12}\right)^3 \text{ ft.}^3$$

$$=(3.2808\dots)^3 \text{ ft.}^3=35.31\dots \text{ ft.}^3$$

In this case the only "side work" would consist in finding the cube of 3.2808. Thus there is only one division by 12; the cubing is left to the end; and the chances of error are reduced to a minimum. Besides, this method has the advantage of showing how many figures should be retained at each step in order to secure a given degree of accuracy.

The above is only given for the purpose of illustration. Better results, both for square and for cubic measure, are obtained by using the figures 2.54.

It may be convenient at this point to refer to land measurement. We have 1 chain=22×0.9144 m.=20.117 m.; whence 1 square chain=404.70 m.², or 1 acre=40.470 ares, and 1 square mile=2.5900 km.²

The above will furnish some more oral exercises by reckoning 20 metres to the chain, 40 ares to the acre, and 2½ square kilometres to the square mile. The first of these approximations is correct to within nearly $\frac{1}{2}$ per cent. for linear measurement; and for area measurement its accuracy is the same as that of the second, that is, correct to within nearly 1 per cent. The error in the third is about 3½ per cent.

In dealing with measures of weight there are certain peculiar difficulties which are accentuated when we arrive at measures of capacity.

There are two or three different meanings attached to each of the words *kilogram*, *litre*, *pound*, and *gallon*. Thus we have the official standard (e.g., Borda's kilogram), the legal standard (e.g., the kilogram expressed as the weight of a litre of water), and the scientific standard (e.g., the kilogram defined as the mass of a cubic decimetre of water). The full consideration of these must be left to the expert; and we certainly should not confuse our pupils' minds by referring to such difficulties, especially when we are trying to impress upon them the advantages of the metric system!

But two conclusions are obvious. First, we must, for the sake of clearness, make up our own minds as to which of these various standards we shall adopt. Secondly, we must not attempt a degree of approximation so high as to render the various determinations inconsistent.

Now, in the case of the metric system, it seems clear that we ought to adopt the *scientific standards*. We shall, therefore, assume that the gram is the mass of a cubic centimetre of water under definite conditions, and that the litre is exactly one cubic decimetre.

But in the case of the British system, the advantages of the scientific standards are not obvious. Not only is the scientific comparison of the British with the metric units too difficult for a school course, but also the results will be found to vary because our legalised scientific definitions are inconsistent.

We should, therefore, recommend teachers to accept the official "standard pound" as the British unit of mass, so that the relation between this and the scientific kilogram can only be determined by actual weighing; and to *assume* that the legalised metric equivalent applies to these two units.

But it might be instructive to indicate a method of comparison by setting the following problem:

"Determine the number of pounds in a kilogram, assuming that a cubic foot of water weighs 1,000 oz."

Since 1 kilogram is the weight of water contained in $10^3 \text{ cm.}^3 = \left(\frac{10}{2.54 \times 12}\right)^3 \text{ ft.}^3 = 0.035314\dots \text{ ft.}^3$

$$\therefore 1 \text{ kilogram} = 35.314\dots \text{ oz.} = 2.2071\dots \text{ lb.}$$

We should then state that a cubic foot of water weighs rather less than 1,000 oz.; and it might interest the boys to know that the legal equivalent of the kilogram as determined in 1897 is 15432.3564 grains! We could use this as follows:

"Assuming that 1 kilog. = 15432.4 grains, is it more correct to say that 1 kilog. = 2.205 lb., or that 1 grain = 6.48 centigrams?"

Taking 1 kilog. = 2.205 lb. = 15435.0 grains, we see that the error is 2.6 grains.

But if 6.48 centig. = 1 grain,

we find 1 centig. = 1 grain $\times \frac{1}{6.48} = 0.154321\dots$ grains,

$\therefore 1 \text{ kilog.} = 15432.1\dots \text{ grains.}$

So that the error is 0.3... grain.

Thus "1 grain = 6.48 centigrams" is the more accurate statement.

Again from the legal equivalent we obtain 1 grain = 6.47989 centigrams. Hence a clearer way of writing the previous statement is "1 grain = 6.4800 centigrams"; the approximate error being about 0.0001 centigram.

It is noteworthy that the error in reducing British weights to the metric system, or *vice versa*, by means of the simple formula "1 grain = 6.48 centig." is less than two per million. Using these figures the class can find that 1 lb. = 0.45359 kilog.; whence 1 cwt. = 50.802 kilog., 1 ton = 1.0160 tonnes (or milliers), and 1 oz. av.

= 28.350 grams. Good results, correct to within $\frac{1}{3}$ or $\frac{1}{4}$ per cent., can be obtained by taking 1 grain = 6.48 centig., and 1 lb. = 5 kilog. For oral purposes we might use 3 grains = 2 decigrams, 2 cwt. = 100 kilog. = 1 quintal, and 1 ton = 1 tonne, each correct to within less than 2 per cent.; and possibly also 1 oz. av. = 30 grams, in which the error is about 6 per cent.

The special difficulty in dealing with measures of capacity is chiefly due to the ambiguous meaning of the word *gallon*.

We might set the following question:

"Assuming that 1 gallon contains 277.274 cubic inches, how many litres are there in a gallon?"

$$\begin{aligned} \text{Here } 1 \text{ gallon} &= 277.274 \times (2.54)^3 \text{ cm.}^3 \\ &= 4543.7 \text{ cm.}^3 = 4.5437 \text{ litres.} \end{aligned}$$

Or we might set the following:

"Assuming that 1 gallon contains 10 lb. of water when a cubic decimetre contains a gram of water, and also assuming that 1 lb. = 0.45359 kilog., find how many litres there are in a gallon."

$$\text{Here we obtain } 1 \text{ gallon} = 4.5359 \text{ litres.}$$

The discrepancy, due chiefly to the neglect of temperature, is sufficiently obvious.

The simplicity of the latter method will appeal to some; others will prefer the greater accuracy of the former method. But should we use either —except as an example? Why not have resort, as in the case of the kilogram, to authoritative experiment?

The reply is that the authorities differ from one another nearly as much as do the above results. Further, in one of the carefully compiled tables, referred to later, we find the following statements: 1 gallon equals 4.5466... cubic decimetres, 1 gallon equals 4.5459... litres, and 1 gallon of water weighs 4.5359... kilograms. The latter measurements refer to the *commercial* litre and kilogram; but we decided that the *scientific* units should be adopted.

It is true that there is the official metric equivalent ordered in 1897, viz., 1 gallon = 4.5459631 litres. But in the vast majority of questions we should have no guarantee that the gallon used was the official gallon, nor should we know whether the litre meant a cubic decimetre or not! Clearly such measures must be regarded as indeterminate quantities, and be avoided in all accurate investigations.

The gallon, therefore, should be left to the individual teacher to introduce in whatever manner he pleases, provided always that it should be used only in oral work or in rough calculations.

If we take 1 gallon = 4.536 litres, we obtain 1 quart = 1.134 litres and 1 pint = 0.567 litre. These results are probably correct for any of the various British "gallons" to within about $\frac{1}{4}$ per cent. (They are quite untrue for the American and the Canadian gallons.)

But it will be safer if we confine ourselves to oral examples, reducing both gallons and pints to quarts in every case. We should then use the equation 7 quarts = 8 litres (error about 1 per

cent.), or even assume the practical identity of the quart with the litre.

The only part of arithmetic interesting to the average boy is that which is probably most repugnant to his masters and unenlivening to his parents, viz., bills and accounts. Here he feels that he is dealing with something real and useful, a subject that places him upon a mental level with some of his respected seniors.

Hence it may be found that the conversion of bills from the British to the decimal system will prove not only instructive, but even entertaining to the class. Such a question as the following, involving many different kinds of units, might be set.

"Make out, in the decimal system, a bill for the following items: 3 tons of coal at 23s. 9d.; 4 cwt. of coke at 1s. 1½d.; 14 gallons of oil at 5½d.; ½ pint of spirit at 2s. 6d.; 2½ yd. of cloth at 1s. 1½d.; 18 inches of brass tubing at 3½d.; 20 lb. of sugar at 2½d.; 3 oz. of ointment at 1s. 9d.; and 120 grains of quinine at ¼d."

Each boy should use his own rough approximations, expressing the quantities as simple multiples or submultiples of the most convenient metric unit, and calculating the price to the nearest "mil." For example:

3 tonnes of coal at £1·187	£3·561
2 quintals of coke at £0·113	£0·226
32 litres of oil at £0·010	£0·320

The total can afterwards be compared with the original as a test of accuracy.

Pairs of questions of the following type will help to prove the superiority of the decimal system.

"Find the cost of painting the walls, inlaying the floor, and gilding the cornice around a room of the following dimensions :

(1) 6 yd. 5 in. long, 5 yd. 1 ft. 2 in. broad, and 3 yd. 2 ft. 8 in. high, at £1 7s. 6d. per sq. yd. for painting, 1s. 10d. per sq. ft. for inlaying, and 3 halfpence per inch for gilding.

(2) 6·05 m. long, 5·12 m. broad, and 3·28 m. high, at £1·76 per sq. m. for painting, £0·011 per sq. dm. for inlaying, and £0·003 per cm. for gilding."

It will be observed that the same digits occur in each of the above questions; yet in the former case a great deal of reduction is needed, whilst little is required in the latter, and that little is performed merely by moving the decimal point.

In putting such a course as is here suggested into practice, a few points should be emphasised. Special attention should be called to the fact that, for conversion from either system to the other, two formulæ, and two only, are absolutely essential; viz., 1 in. = 2·5400 cm., and 1 grain = 6·4800 cgm.

From these two equations each boy should construct and enter permanently in a note-book a table expressing the inch, foot, yard, mile; square inch, square foot, square yard, acre; cubic inch, cubic foot, cubic yard; grain, ounce, pound, hundredweight, and ton, in the decimal system to five-figure accuracy.

No attempt should be made to commit such a table to memory (with the exceptions, perhaps, of the two remarkable formulæ last mentioned). The table should be used only for exact calculation to four- or five-figure accuracy.

For general purposes a few approximate results might be learnt by heart. Of these, perhaps, the chief are: 12 yards = 11 metres, 5 miles = 8 kilometres, 1 acre = 4 dekars, 11 lb. = 5 kilog., 2 cwt. = 1 quintal, and 7 quarts = 8 litres.

Boys with good memories could add the following: 6 sq. yd. = 5 sq. m. (5 centiares), and 4 cu. yd. = 3 cu. m. (3 steres); the former of which is correct to within $\frac{1}{2}$ per cent., and the latter to within about 2 per cent.

Care, however, must be taken that the pupils neither confuse these rough results nor regard them as strictly correct; and in the case of boys with weak memories, it may be advisable to confine their attention to the approximate identity of the yard with the metre, the ton with the tonne, and the quart with the litre.

The teacher will desire to know where he can obtain manuals and models specially designed to aid in the comparison of the metric with the British system. A wonderful pennyworth of information in the shape of a complete set of tables (up to date, being based upon the Order in Council for 1897) can be found in "Metric and English Weights and Measures," published by Messrs. Radley and Co. (30, Theobald's Road, W.C.), who also publish a handy card containing the principal equivalents. Many hints useful to teachers are given in the "Elementary Physics and Chemistry" and other science manuals written by Messrs. Gregory and Simmons (Macmillan). Messrs. Philip and Son (32, Fleet Street) publish two handbooks. The first is called "A Complete Manual of the Metric System" (price 3d.). The answers to the examples can be obtained for 3d. This manual is intended to accompany their "Diagrams and Synoptical Tables of the Metric System, with the English Equivalents" (price 7s. 6d.). The second is called "British and Metric Weights and Measures" (price 3d.). This accompanies "Philip's Comparative Cabinet of British and Metric Weights and Measures" (price £1 10s.). The title explains itself, and its use for practical illustration is evident.

In conclusion, the reader is asked to consider this in connection with the previous article on the same subject; and to remember that more than three hundred millions of persons in twenty different countries use only the metric system.

Tommy Smith's Other Animals. By Edmund Selous. vii + 214 pp. (Methuen.) 2s. 6d.—This sequel to "Tommy Smith's Animals" will probably become as popular as its predecessor. It is by no means a new idea to convey information on natural history by the medium of imaginary conversations between a child and his animal friends, but it is rare to find the idea carried out by an accomplished naturalist with the raciness and art which Mr. Selous here displays. The spirited illustrations by Miss Augusta Guest add to the attractiveness of the book.

MEDIÆVAL ENGLISH HISTORY.¹

THE fifteenth century is a dreary, uninteresting period in English history, and even in much of European history too. In that age the ideals of State and Church were breaking down. The Church had become stereotyped and was nothing much more for the people than a privileged caste whose interests, financial and political, diverged more and more from those of the laity, especially of the northern nations. The nobility had become wealthy and politically all-powerful, and kingship could not do much for the protection of the poor against the rich. Civil war, open or concealed, was chronic in all countries. With the approach of the sixteenth century, and during the first half of its course, a change was apparent, at least in the western states of Europe, in England, France, and the Iberian peninsula. Out of the wrecks of feudalism that had become self-destructive arose strong monarchies, and in this country the Tudors had, before the middle of the century, subdued not only the Church and the nobility, but had made Parliaments, when not unnecessary altogether, all but entirely subservient to the royal will.

In these two volumes (volumes iv. and v., the sixth and seventh to be published, of "The Political History of England in Twelve Volumes") the story is told first of the anarchy and then of its cure. Mr. Oman has the more thankless and perhaps the more difficult task. This is partly because of the endless detail of the constant personal rivalries wherein no principles are involved and partly because, as he says (p. 497), "the original authorities grow worse and scantier as the years go by. . . . The chronicles gradually sink from history into meagre annals, and finally dry up altogether . . . and official documents are scarcely accessible, because the Record Office publications do not touch the fifteenth century save in one or two sections." No wonder the story is uninteresting. We do not yet know the whole truth. Mr. Fisher has an easier task. There is a wealth of literature, contemporary and modern, which makes it possible to write the history of the Tudor period with something approaching to finality. What difficulty he has arises largely from the conflicting views of Roman Catholic and Protestant writers, a conflict which tends to diminish as the documents are discovered, published, and studied.

Mr. Oman tells his story clearly and fully in chronological order. Indeed, he thinks of his history as "annals." More than that, in the present state of our knowledge, they cannot be. But there are exceptions. The revolt of 1381 has been studied of late years in local documents, and it is possible now to know something more of that peasants' revolt than that "Wat

Tyler" began it at Dartford and that Richard II. ended it at Smithfield. The "Wat Tyler" of our old text-books, indeed, quite disappears, and instead we read of various leaders and much detail previously unknown. Mr. Oman thinks that Wycliffe's doctrines were not a cause of the rising, but he maintains the old theory that the revolt did not put an end to villeinage. That was a result of slow-moving changes. The reign of Richard II. is becoming clearer, and the causes of his sudden fall are becoming comprehensible. He "fooled away the crown by arrogant tyranny," the arrogance being greater than the tyranny. As compared with Shakespeare, who has been for most of us the authority for these years, the Lancaster of Richard II.'s reign is not the noble patriot, but an incompetent and selfish intriguer, with desires more in Spain than in England.

On the other hand, Owen Glendower comes out of the mists of magic into a serious and interesting historical character, playing a large part not only in Welsh but in English history. Henry V.'s character sinks somewhat. His wild doings in London seem to be probably true as well as his conversion on his accession. But that conversion was to a narrow-minded bigotry. "Staid, cautious, deliberate, with an iron will and rigid ideas of orthodox piety," a "model king, courteous, laborious, self-contained, deliberate, but certainly not genial or spontaneous." "His piety made him a persecutor." "He commands our intellectual and moral respect, but no one can call him a sympathetic or a lovable character" (p. 232). Of poor Henry VI. we have a sympathetic and pitying sketch, with which our readers will probably agree as much as they will protest against Mr. Oman's opinion that such a person "ought to have been a monk or a schoolmaster" (p. 336). His weakness was one of many causes which led to the downfall of the House of Lancaster and to the wild orgy of personal ambitions which make up the short annals of the Yorkist House and the "crimes" of Richard, Duke of Gloucester.

With the new dynasty we begin to get into more hopeful days. We do not agree with Mr. Fisher (p. 20) that Henry VII. created the Star Chamber (the volume to which he refers as his authority for this statement gives us a different impression); but that famous court came into more active life under the Tudors than before and served to break the power of what nobility were left. We are glad that Mr. Fisher gives us a chapter on the Renaissance, and thus transgresses the nominal limits of his title. We learn from him the non-existence of Morton's fork and the true story of Warwick's end. We learn also that the ecclesiastical landlords were often as business-like and hard as any of the new men who succeeded them in the abbey lands. But the main subject, of course, of this volume is the reign of the mighty lord who broke the bonds of Rome. Wolsey's character somewhat falls as compared with recent bio-

¹ "The History of England, 1377-1485." By C. Oman. xvi+525 pp. "The History of England, 1485-1547." By H. A. L. Fisher. xx+518 pp. (Longmans.) 7s. 6d. net each.

graphies of him. Mr. Fisher thinks that Dr. Creighton's sketch was "too eulogistic." The story of the Reformation Parliament and of the subsequent changes in the worship and doctrine of the English Church is told in full detail, and some light is thrown on the methods by which Henry VIII. got his way with Parliaments. Partly by force of character, partly by careful packing, partly because for a long while his was the only life between England and a renewal of civil war, partly, too, because there was a large body of Protestant belief, especially in the south-east, and certainly much "Lollard" dislike of clerical wealth and privilege, Henry worked out the great change which differentiates all modern from all mediæval English history. Space forbids us to dwell further on the contents of these volumes. We will only add that they are each supplied with maps, plans, genealogical tables, and, above all, with very full bibliographies. Not only are the authorities named, but they are described so as to guide the student to what is best and to warn him against the bias of those that are not so good.

THREE ASPECTS OF EDUCATION.¹

HERE are three books devoted respectively to the physical, moral, and intellectual sides of education. Interesting as they all are, it cannot be said that the first two teach us anything that has not been hammered into the educational reviewer for ten years and more. Dr. Sargent, who writes with knowledge and enthusiasm, and who has actually done the things he talks about, believes in physical training *for all*. So do we : but, alas, we only believe. Our faith is not followed by works. He deplores professionalism, gladiatorial conflicts, and all that helps nature to make man a beast again. So do we : but those who know best say we are only moderately successful in our efforts to make games humanising ; in America they do not seem to be successful at all. We all know the ideal; but in this, as in every other department of education, our camps are as numerous as our schools. The book is fresh, buoyant, American ; and, unlike Dr. Harper's "Education and Social Life," it is hopeful.

But Dr. Harper's volume is not hopeful; it is sad. Again and again the submerged tenth troubles him, and education codes, inspectors, and departments weigh heavy on him. Christianity, too, he says, is so inert, so complacent : why are not men better? Surely the answer is found in his own volume. All theory about education is, as he himself shows, in a chaotic state. How can it be otherwise when Ruskin and Herbert Spencer and the Moral Instruction League exist side by side, preaching gospels so different that

even to read them induces confusion? There is no use mincing the matter. We do not get on because we do not know what we want. There are so many aims in education that we cannot make up our mind to take one. Again—and this seems a defect with all such books—granted that we admit the importance of psychology; what psychology is there to lay before teacher or moralist? Our author builds all up from this : "Man consists of a body and a soul." Is it possible to do more to-day than to say, "Man consists of a body, which, in some way not understood, thinks and wills"? Psychology has itself to thank for the impatience with which practical teachers regard it.

The book is a plea for common sense in matters physical, and for the training of teachers in psychology and economics. Everything, even the very uncertain teachings of history, has to serve the moral and religious end; and this though, as our author admits, many writers view morals as merely an expedient of civilisation, and many good educationists (the Japanese, for instance) would deny his dogmatic statement : "The Bible is the history of redemption and of the grace of God." The whole book is thoroughly interesting ; but its main positions have been maintained—and denied—many times before.

The altogether delightful volume on the Renaissance takes us away from contemporary chaos in morals and religion, and transports us to the society of the dead who did good work in their generation. There are chapters on the humanist reaction, on Rudolph Agricola (so important and yet so silent in his lifetime), on the ever interesting Erasmus, on Corderius, whose books were used up to a few years ago, on Ludovicus Vives and Sir Thomas Elyot—and every man lives. Perhaps the chapter on Agricola is written with more sympathy than some of the others ; but the book teems with learning worn gracefully. It is in reading such books as this that the futility of our modern quarrels on education comes home to us. We are apt to forget, though, that in the days of Erasmus and Melanchthon discussion was just as busy.

THE DIRECT METHOD OF TEACHING MODERN LANGUAGES,

WITH SPECIAL REFERENCE TO THE TEACHING OF GRAMMAR AND THE USE OF TRANSLATION.²

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OUR object in teaching a foreign language to children at school is not to use the teaching of it as a vehicle for teaching English, or grammar, or morality, or anything else, but simply to put our pupils in possession of the language ; secondly, we must introduce them to the foreign people, their life and ways, and consequently to something of their history ; thirdly, we must initiate them to what is best in their literature, and thus, by widening their sympathies and deepening their insight into human nature,

¹ "Physical Training." By Dr. D. A. Sargent. 310 pp. (Ginn.) 6s.
"Education and Social Life." By Dr. T. Wilson Harper. 315 pp. (Pitman.) 4s. 6d.

"Education during the Renaissance." By Prof. W. H. Woodward. 336 pp. (Cambridge University Press) 4s. 6d.

² Abridged from a paper read at the London County Council Conference of Teachers, January, 1907.

it is our privilege and duty to contribute to a saner and kinder philosophy of life.

What we mean by "possession of the language" is:

(1) That our pupils shall be able to understand it when spoken, and speak it so as to be understood.

(2) That they shall be able to understand it when read, and read it so as to be understood.

(3) That they shall be able to write it idiomatically and correctly, and, as a crowning accomplishment only, that they shall be able to translate good English into the nearest possible equivalent the foreign language affords.

This is the reverse of the order of advance under the old grammatical method, under which *translation* (both into and from the foreign language) with endless writing—the millstone of grammar about their necks—ranked first. *Reading* came next, if there was time and the teacher thought fit, and *speaking*, if it came in at all, came in as a crowning accomplishment only. I also take it we are agreed that grammar should be taught, so far as possible, inductively, and be "no longer mistress, but handmaid," and that the mother tongue should be kept in the background.

It is when we come to the application of these principles that "doctors disagree."

Common sense is the all-important intuitive guide in the application of principles. Still, it is extraordinary how different one man's common sense is from another's, and what inconsistencies are committed by one and the same man in the name of that arbiter. We must take the trouble to analyse the logical bases of our methods so that our teaching may be a harmonious co-operation of forces working towards the same end. If I hear a teacher tell a boy who stops short while reciting a piece of poetry, "Think of the English," I feel sure there is something wrong in his conception of the Direct Method; or if a boy, when asked to say in French what another boy who is going out of the room is doing, says, "Please, sir, I don't know the French for 'out,'" I know at once that his attitude towards the foreign language is wrong.

On the other hand, those "New Methodists" who think that they can leave grammar to take care of itself, that it will gradually soak in, certainly live in a fool's paradise, and those who completely eschew translation deprive themselves of a valuable test. But it is a mistake to think that whatever is useful as an integral part of one system of teaching will necessarily also be good in another. Patient analysis of underlying principles is the only guide in these questions of comparison and selection.

Consider for a moment the principle that the spoken language must take precedence. What truth does that rest on or imply? Why, that the essential condition of acquiring a language is to acquire that sense for it, that *Sprachgefühl*, which in every language is far more important than grammar as a determining factor in its growth and as an arbiter in questions of taste. The greatest writers in any language are those who have had the keenest, the most unerring *Sprachgefühl* for it. The soil out of which it grows is the spoken tongue, the common possession of the whole nation; its mysterious influence often baffles analysis, but its presence is felt; it distinguishes the really national writer from the mere academic man of letters; and perhaps the best definition of it would be the intuition of the fundamental sense-experiences that lie at the root of all linguistic expression. I think it was Gouin who defined the acquisition of a foreign language as the *translation of experience into that language*. There you have the whole theory of the Direct

Method in a nutshell; its object is the building up of an entirely new *Sprachgefühl* by repeating in the pupil, so far as possible, the process by which is built up in him his *Sprachgefühl* for his mother tongue.

And just consider what results from this. It compels us to adopt as the determining factor in tracing our course, not linguistic form, but linguistic content. The pupil must act, suffer, perceive, so to speak, in the foreign language; that is to say, he must be made to repeat the foreign expressions for what he does, suffers, perceives, until each calls up the other. A child's first steps in a foreign language, therefore, must be within the range of his most familiar experience.

Meanwhile, it is for the teacher so to select and systematise these "translations of experience" that the pupil learns at the same time the most common facts of grammar and the most useful vocabulary provided by each sphere or category of "experience." Thus, though the content, as I said above, will be the determining factor, this content will be arranged in accordance with considerations of grammar and vocabulary. It was Gouin again who discovered the remarkable value of "normal series of actions," in these first stammerings of the "infant foreigner," as the pupil might be called, since, according to the theory, he is building up in himself a kind of foreign second nature. Their great value lies in the help given to the sense-memory, in establishing the new set of associations, by the fact that the actions occur in a necessary order, viz., the chronological order. I need not go into further particulars on these "Gouin Series," as they are no doubt familiar to you. But you have only to think for a moment to see that practically the whole of a child's experience may be presented in such series, supplemented by object lessons, the two together covering two important fields of speech, narrative and descriptive.

You will also readily see that it needs little ingenuity so to systematise these series that the pupil learns, while, as he thinks, merely performing or seeing performed a series of actions, the chief forms of the verb—that "soul" of the sentence, as Gouin calls it. He thus learns his grammar "in the concrete," so to speak; and only those who have tried this device know how trustworthy are the new associations thus formed. Of course, as soon as a sufficient number of similar forms have been assimilated, the pupils are made to classify them and induce the main rules of conjugation and concord, to be used thenceforth as tests of grammatical accuracy to be applied to the foreign expression which the sense-experience calls up.

Observe that this is already essentially "reproduction," that chief means of assimilation under the Direct Method, viz., the reproduction of the foreign expression associated with the sense-experience. There is no intervention of the mother tongue. Even if the first time the pupil says "*Je me lève*," while getting up from his seat, he says to himself "that means *I stand up*," before he has repeated it many times the English equivalent will have vanished, simply because it is not needed; and thus we lay the foundations, in the cultivation of sense-memory, of the habit of Visualisation—the essential condition of the reproduction, at a later stage of study, of a narrative read or heard.

The process is as follows: as, in the case of *Je me lève* (what we may call the dramatic stage), the will renews the sense-experience which calls up the foreign expression associated with it, so in the later narrative stage the will revives the visualisation of the story, which in its turn evokes its foreign expression. The foreign sentences

spring, so to speak, fully equipped from the brain, but are tested as regards their grammatical form, if possible before they are uttered. Observe, too, that even in the elementary or dramatic stage it is possible to practise what is really *Free Composition*. For what else is it but *Free Composition* when a pupil is allowed to combine actions into a new series of his own invention, or by a rearrangement of familiar objects to compose a new object-lesson?

And now compare with what I have been describing the underlying principles of the old grammatical method.

The first thing put into the pupil's brain was an abstract grammatical scaffolding; abstract logical processes (all in English, of course) presided over the translation, both from and into the foreign languages, the consequence being that the sense was often neglected, if not completely sacrificed, though so far as "Mistress Grammar" was concerned, *l'honneur était sauf*. Indeed, when translating into the foreign language, the final foreign product, put together bit by bit, like a mosaic, was barely tested as a piece of original French, or German, as the case might be; the whole task, the whole interest, if any, lay in reaching the point where the living foreign expression began.

We have two pitfalls to avoid: on the one hand, the neglect of grammar-teaching of a few and the neglect of grammar-drill of many reform teachers; on the other, the isolated, formal grammar-teaching of the old *régime*.

The new ideal bids us teach grammar, so far as possible, in a concrete form, not merely for the purpose of "inducing" the laws of accidence and syntax, but, above all—and this is the novelty—for the purpose of teaching the particular forms in detail before such induction, and for purposes of drill after the induction.

It is evident that the habit of *direct association* must tend to make the application of the above laws instinctive from the beginning, for the direct association enables the child to dispense with most of the analysis necessary, in the grammatical and translation method, to construct correct expression.

It makes all the difference whether a child, when he and his fellows are opening their books, says to himself spontaneously: "*Nous ouvr-*," and then reflects: "After *nous* we have *-ons*, which makes *Nous ouvr-ons*"; or reasons thus: "We open our books—'we' is first person plural; verb, *ouvrir*—first plural present, *nous ouvrons*." It is not at all the same thing whether, when he has to put a story into the past as told by one of its actors, he visualises the whole thing as done by himself the day, week, or year before, thus evoking a series of "*J'ai*," "*je suis*," or "*je me suis*" in answer to the successive questions: "*Qu'ai-je fait ensuite?*" or goes through this process in English, and then reasons: "These verbs must be put into the past indefinite, because it is spoken narrative—*i.e.*, I must use the auxiliary *avoir* or *être* with the past participle."

Accordingly, in the elementary stage we must use, as our instrument for teaching and driving home the main facts of grammar, what makes the deepest impression on the sense-memory, viz., the process of describing actual objects or pictures of objects, and that of expressing actions actually performed, seen, foreseen, or remembered.

Later, when the habit of *visualisation* has taken the place of the actual *sense-experience*, as the "compeller" of direct association, and object-lessons and action series have given place to graduated short stories, as the centre of study, these will, of course, at the same time form the vehicle for inculcating further essential points of grammar, which will thus, until they become part of the learner's common and, so to speak, automatic stock of grammatical

knowledge, be associated with a definite context, itself secured by direct association.

The indispensable exercises for the practice of special grammatical points, as I have hinted above, must be based on familiar material, so as never to lose the support of the direct association and the element of reality, and must be presented in the most concrete form possible. For example, to give practice in the rules of concord, the pupil will be told to rewrite a story, quite within his range, as if there were two actors instead of one, or as if the person were a woman instead of a man, or as if the person himself or herself told the story, &c., making all necessary changes. Such exercises present themselves to the pupil, not as a mere formal exercise in grammar, but as a modification of the mental representation which the text calls up, a modification which demands another linguistic form. They have the invaluable advantage of combining the exercise of common sense with the application of grammatical tests, and thus form the lowest rung, so to speak, in the ladder of original or free composition regarded from the grammatical point of view—just as the modifications invented by a pupil in a series or an object lesson, which I spoke of above, are the lowest rung in the same ladder, regarded from the point of view of content.

In such exercises the pupil begins to feel his new power; he is in some small measure creating, and there is nothing like that feeling as an incentive to persevering effort. Even conjugation drill may be made much more real by insisting on having verbs conjugated in an actual complete sentence, however short: *e.g.*, "Conjugate *naître bon, lui en vouloir, en savoir quelque chose*," &c.

In so far as a teacher uses, to give practice in grammatical rules, that form of "reproduction" known as "retranslation," he approximates to the Direct Method, for he uses as his practice ground a definite linguistic content, already assimilated, thereby bringing the sense into the foreground, and inducing that wedding of sense to grammar which constitutes correct expression. But here we touch that other shoal, so fatal to many reform teachers—the question of translation.

I need not here repeat the ample and sufficient proofs adduced by Director Max Walter and others to show that the old-fashioned construing is entirely detrimental to the acquisition of the foreign language, and even of questionable service to the mother tongue.

The aim of the Direct Method is to move forward in and through the foreign language, so far as it is possible, without constant comparison with the mother tongue, such comparison interfering with the all-important process of direct association. It is obvious that there must be no haziness as to the actual meaning, especially of the passages to be assimilated for reproduction. There are many ways of explaining the meaning of words and sentences without translating, many ways of testing the truth of the pupil's statement that he understands. And in this connection I should like to say that one of the great advantages of the Direct Method is that it compels the teacher to foster in his pupils from the first the habit of distinguishing between what they know and what they do not know; they must be trained to put up their hands whenever they do not understand, and only the initiated know what a revolution that implies. It means that it is no longer an excuse to plead, "Please, sir, I did not understand!" It means a tightening of the girths all round. It is a discipline in intellectual sincerity.

But the teacher has to be very watchful, and, as an occasional rapid test, translation (oral or written) is not to

be despised. Moreover, it is absurd not to have recourse to it to make the meaning clear when the other means at one's disposal are far-fetched or lengthy. In all this the teacher's judgment alone can decide, for the practice must vary with every class.

But there is one point which must be noticed in connection with this question of translation. It is often said that explanations in the foreign language are no great help to establishing the direct association, because, even when they are successful, they generally lead to a smothered, if not outspoken, utterance of the English word. That is no reason: they have had the benefit of the French in the explanation, and if it was simple and straightforward so that every step was clear, the passing of the English word through the pupil's brain is not more prejudicial to the direct association than it is when the meaning of the foreign word is made clear by actually showing the thing mentioned or a picture of it. The point is that in neither case has the English word been the means of evoking the mental representation; on the contrary, it is the mental representation, evoked by the thing or picture in the one and the French definition in the other, which has in its turn, as a matter of course, evoked the English word. The latter is not an intermediary, hampering the direct association, but a ratifier, if need be, of the latter's correctness.

But what of the "art of translation"—the idiomatic rendering of a well-written passage into the mother tongue or *vice versa* (what we call "composition")? It must be allowed that both forms of translation are the most convenient written tests of anyone's knowledge of a foreign language, and so long as they are used in examinations it is necessary to give our pupils practice therein. Here again let us apply the root principle of the Direct Method, viz., that the direct association is the all-important aim, and the conclusion is obvious. No translation exercise must be allowed which would not conform to the definition "a translation of experience," that is, which is not a test of *Sprachgefühl*. I mean that it must consist in the translation of passages that are well within the pupil's range—*i.e.*, that he understands in the foreign tongue—practically an exercise in English style, though incidentally a test of the pupil's knowledge of French. This kind of translation exercise may be practised from the first, but it need not be frequent. To give an illustration of the principle to be followed in such translation, a pupil ought not to have to translate "*Il aime le chocolat*," "*Rose a les yeux bleus*," "*Quand il est l'heure de prendre le petit déjeuner, Paul descend l'escalier en courant*," &c., so long as the literal English versions intervene between the French and the corresponding mental representations, not until the "visualisation" of the French is so perfect that he says spontaneously in English: "He likes chocolate," "Rose has blue eyes," "When it's time to have breakfast, Paul runs downstairs," &c.

As to translation from the mother tongue into the foreign, the same principle, of course, must apply. In other words, this kind of exercise must not be begun before the pupil has a fair command of the foreign language, and would be able, so to speak, to produce the foreign version as an original free composition. It should be begun as late as possible; indeed, I almost think it would be best to drop this test out of school examinations altogether. The more I teach, the more I realise the profound truth of Vietor's dictum: "*Die Übersetzung ist eine Kunst die in die Schule nicht gehört*." Even "retranslation," which forms an excellent transition from free composition and

"reproduction" to this kind of translation, should be postponed to an advanced stage. The habit of direct association, *i.e.*, "thinking in French," must be firmly established, or the presence of the English words will begin to interfere. That is why it is important to do the "retranslation," at any rate at first, orally, without any English text in sight. The English should be hurled at the pupils, rapidly, in complete sentences, so as to call up immediately the mental representation which is in its turn to evoke some foreign equivalent, the important thing being that this equivalent should be good, not exact; there should be, as it were, a headlong jump into the foreign language, whence a return is then made approximating gradually to the closest equivalent that the language affords. It is easy to see what an excellent introduction such "retranslation" provides to the translation of original passages in English, which should, of course, proceed on exactly the same lines.

As regards the use of the mother tongue as a means of communication between teacher and taught, it must be clear, after all I have said, that the ultimate aim is to do without it altogether. But here again the teacher's own judgment is his only possible guide in practice; only it is important to keep one's eyes fixed on the ideal, and to be always consciously straining towards it.

And here I must stop. I hope what I have said may be of some help in formulating more clearly the policy of that section of reform teachers which Mr. Cloutesley Brereton has so happily dubbed "The Left Centre."

To sum up, the doctrine of the Direct Method is that *Sprachgefühl* is at least as necessary to the mastery of a language as grammatical accuracy—in fact, that the former, rightly considered, includes the latter; further, that in order to develop this *Sprachgefühl*, the language must be acquired by establishing a *direct association* in the learner's mind between the foreign expressions and the objects, actions, perceptions they express, and that to do this successfully there is but one way, *viz.*, Nature's way. *Sprachgefühl* cannot be cultivated backwards. One must begin where the child begins—by the living spoken word in closest touch with sense-experience, to be followed in due course by reading and writing, in which sense-memory and visualisation take the place of sense-experience as "compellers" of the direct association.

Throughout the course of study the constant aim of the teacher must be to train this habit of direct association, and every means of instruction or practice must be welcomed or discarded according as it helps or thwarts its growth.

I think we little realise as yet all that this may mean to future generations.

To begin with, it provides a powerful lever to induce the child to put forth all his energy: for the power of doing things appeals to him as a rule more than the power of knowing things.

But what is still more important is that, by insisting on visualisation and all forms of sense-memory, it tends to develop in the child the habit of remaining in touch with reality when he enters the class-room, a habit which it is the aim of every teacher who is worth his salt to foster and develop in his pupils, so big with promise is it for the whole intellectual life of the nation—for is it not the preliminary condition or the concomitant of all vivid imagination, of all honest thought, of all sincere artistic expression?

Indeed, the Direct Method might well take as its motto: "The letter killeth, but the spirit giveth life."

THE GULF STREAM.

THE following extracts are from a letter by Mr. James Page which was sent in reply to a gentleman who had been told that a mild winter in New York City was due to the fact that the Gulf Stream is running sixty miles nearer shore than previously. It was published in the U.S. *Monthly Weather Review*, and we reprint parts of the letter to correct the numerous popular misapprehensions relative to the part played by the Gulf Stream in the economy of nature.

Speaking with precision, the term Gulf Stream should be limited to that continuous discharge of the water of the Caribbean Sea and the Gulf of Mexico which takes place through the Straits of Florida, a narrow outlet bounded on its western side by the State of the same name, and on its eastern by Cuba and the Bahama Islands and Bank. Through this channel, constricted in its narrowest portion to a width of thirty-two miles, there is a constant outflow of the warm, equatorial waters heaped up in this vast and almost land-locked basin by the persistent action of the trade winds, rising at times in mid-stream to a velocity of four or five knots, and having a constant temperature of 81° F. or 82° F. The impetus imparted to this water by the pressure from the rear is, moreover, sufficient to maintain it in motion for a considerable distance beyond the actual point of exit from the channel proper, which may be considered as terminating at Matanilla Shoal, the northern extremity of the Great Bahama Bank, in latitude 27° north. As a result the stream continues to be felt as a distinct body of warm water about forty or fifty miles in width, moving steadily onward, but with uniformly diminishing velocity and temperature, until a point opposite Cape Hatteras is attained, or even opposite the Capes of the Chesapeake. Beyond this point, however, the warm current spreads out over the adjacent area of the ocean like a vast fan, and the identity of the stream is consequently obliterated in the general eastward drift which characterises the waters of the temperate latitudes.

Speaking then with precision, the Gulf Stream is a current of warm water, forty or fifty miles in width, which emerges from the Straits of Florida, follows the coast of the United States northward as far as the Capes of the Chesapeake, and is there merged in the generally eastward drift underlying the prevailing westerly winds of the temperate latitudes. To describe it in the language of Maury as "a river in the ocean, having its fountain in the Gulf of Mexico, and its mouth in the Arctic Seas," is picturesque, but highly exaggerated and erroneous.

With reference to movements of the stream (viz., changes in its location as a whole), reports of which, furnished by navigators, appear from time to time in the daily newspapers, it may be said that these probably do exist, although within narrow limits. Observations of the "set" experienced by vessels crossing the stream, as also of the warmth of the surface waters, show that the position of the axis, or line of greatest velocity, as also that of the line of maximum temperature, may vary from day to day over a range of fifty miles. The methods of observations employed are, however, so replete with sources of error that little confidence can be placed in any single result. That such movements can have any effect upon the climate in the vicinity of New York is highly improbable, the stream itself in these latitudes being so dispersed as to be almost indefinable, and the modifications of the surface temperatures of the adjacent waters wrought by a temporary change in its position being certainly negligible.

HISTORY AND CURRENT EVENTS.

THE German Emperor has recently received the insignia of the Grand Cross of the Order of the Silesian Knights of Malta, i.e., of a branch of the Order of St. John of Jerusalem. English-speaking readers know of this order in the Middle Ages under the name of Hospitallers, and in modern times under the name of Knights of Malta, the owners of that Mediterranean island the possession of which was the occasion for the renewal of our war with Napoleon in 1803. The order was founded to help pilgrims to Palestine; it existed to fight the battles of Christendom against the "infidel," i.e., the Moslem. It survived its twin-order, the Templars, and still exists, now, so the German Emperor and Count Praschma said, to fight new forms of "infidelity." The Emperor's initiation into this ancient order is further interesting, as we know he likes to regard himself as a successor of the Holy Roman Emperors, those mediaeval chiefs of Christendom, in whose service, at least nominally, all those crusading hosts used to fight. Compare William II. with, e.g., Frederick I., whom his Italian subjects called Barbarossa.

WE have had occasion in these columns, now and then, to refer to what might be regarded by an unprejudiced outsider as the curious inaptness of the House of Commons to its professed business—the constant alteration of laws. It may occur to our readers to wonder how it is we are saved, considering the ignorance of the average member of that body, from greater evils than we actually suffer. Of course, there is much that we do not escape: many of us are feeling now the effects of the want of thought with which the provisions of the recent Workmen's Compensation Act were suddenly enlarged. But much inconvenience is avoided by devices to which the House of Commons has had recourse to prevent it from some of the consequences of its own actions. One of these is the employment of a skilled lawyer to draft the Bills which the "Government" introduces. Another was referred to in Mr. Burns's speech the other day. He "advised the House to read the Bill a second time. As it was packed with technicalities, the proper tribunal to consider it was a Select Committee."

WE are all thinking just now of the Conference of Colonial Ministers which is shortly to take place at Westminster. The problem of the government of the British Empire, which is always before us, has therefore given rise to several statements of opinion. We propose here to quote and comment briefly on some of the more important. Early in February, Mr. Alfred Lyttelton suggested, for the purpose of controlling an Imperial revenue, a board composed of representatives of the United Kingdom, of India, of the self-governing colonies, and of the Crown colonies. But the most interesting part of his proposal was that this board should sit annually in successive years at Montreal, Bombay, Cape Town, and Sydney. In other words, Mr. Lyttelton thinks of the Empire, as composed mainly of four masses of territory, Canada, India, South Africa, and Australia. Note that he omits the British Isles. That is pre-eminently politics of the future, or, to vary the phrase, history of the future, perhaps a distant one, when the British Isles, having exhausted their iron and coal, and of small population compared with the rest of the Empire, will be the least important part of the British world.

COLONEL HUGHES, of Ontario, declared himself in the Canadian House of Commons in favour of "one great Imperial Parliament with representatives from every com-

ponent part of the Empire." "This Parliament," he said, "should be independent of the British Parliament, which would confine itself to home affairs." (We are reminded of James VI. and I., who wanted to be King of Great Britain, and told the English House of Commons that foreign politics was not its business.) On the other hand, the Premier of Newfoundland severely attacked the Imperial Government, charging it with sacrificing the colony. "No colony would be safe," he said, "however important its enactments, if the Imperial Government arrogated to itself authority to suspend such enactments." Sir Wilfrid Laurier, the Canadian Premier, being appealed to on behalf of Newfoundland, said that "so long as Newfoundland remained outside the Confederation, Canada could only tender her sympathy"; and we are told by one who ought to know that "the proposed Imperial Council is regarded askance by many prominent Australians, who fear its being misused to pledge the colonies to action which is not approved by their Parliament, or to hamper the responsible Minister in an emergency." Does the British Empire as a whole desire centralisation, or Home Rule?

ITEMS OF INTEREST.

GENERAL.

THE Headmasters' Conference, the Headmasters' Association, and the Assistant-masters' Association have all recently passed resolutions recommending the adoption of the reformed pronunciation of Latin, the two former by large majorities, the last *nem. con.* Resolutions of these bodies are not binding upon their members, and may have effect or not according to other circumstances; but it is most encouraging to find that the Board of Education has issued a circular to schools which earn grants directing them to adopt the reform, and instructing the inspectors to see that it is done. This is bound to have far-reaching effects, even though a loophole is unfortunately left for the conscientious objector. We are tired of the conscientious objector: he is doing infinite harm to England in many departments. In this case he will have to make out his case to the inspector, and we pray that the inspectors' hearts may be hardened. There is really no difficulty in the reform, as all testify who have tried it; and the gains are great all round. We are glad to see that the Board also insists on careful pronunciation of quantity.

THE report of the Teachers' Registration Council for 1906 is not exhilarating reading. Regulation 4, relating to qualifications and approved standards of general education, ceased to be operative in July last, and since that date registration in column B has been practically at a standstill. Only five applications were received under regulation 3, which refers to training. It is scarcely surprising, the report states, that teachers who trained in 1905, and who during 1906 underwent probationary service which completed their qualification under regulation 3, should, in present circumstances, feel unwilling to incur the expense of registration. A more disturbing qualification arises from the fact that there is no likelihood that the number of such teachers will be appreciably increased during 1907. The uncertainty which prevails as to the fate of the Register has proved a serious check to the movement for training. Information received from training institutions shows that the total number of students in residence is considerably below that of the last few years. The council feels that, in the reaction following on the proposal to abandon the Register, intending teachers are attaching but little import-

ance to the clause in the regulations for secondary schools stating that after July next stress may be laid on training as a qualification for school work. Moreover, while the supply of teachers remains deficient, and the demand for their services increases, they are finding more and more encouragement to enter on school training as soon as an academic qualification has been attained.

WITH regard to the position of the Register after the present month, the report states that the acceptance by the Government of Lord Monkswell's amendment to the registration clause of the Education Bill of last year, by which the Government proposed to bring the present Register to an end, may be taken as indicating a policy with which the Board of Education feels able to concur, and the Registration Council now expresses its hope that the withdrawal of the Bill will not prevent the establishment of the scheme foreshadowed in the amendment, with the cardinal features of which the council is entirely in agreement. Experience in the administration of the Order in Council has convinced the council that a dual Register with a distinction based on the type of school in which the teacher has served is impossible to maintain. The council desires to see a Register in a single column to which the condition of admission shall be a high qualification, both academic and professional, and in which the name and type of the school where experience has been obtained, as well as the individual qualifications of the teacher, shall be indicated.

FURTHERMORE, the council expresses the conviction that the formation of a professional council responsible to the Board of Education for the policy as well as for the administration of the Register is a step which would command the confidence of the teaching profession. To constitute such a council fresh legislation would doubtless be needed, but, pending this, the Registration Council suggests that the Board should, with the advice of the Consultative Committee, apply for the issue of an Order in Council, which should provide for a scheme of registration prescribing regulations in less detail and allowing to a new Registration Council a larger discretion in the interpretation and administration of the Order. Should a new Register be constituted, the old and the new Registers should be dovetailed, but there are grave objections to carrying over to the new Register the names of 80,000 or more teachers now entitled to be on column A, with the 11,000 registered in column B. Some course must be discovered which will satisfy the joint claims of both branches of the profession, and will deal as tenderly as possible with the existing rights of registered teachers and at the same time will not swamp with numbers the new Register.

A RECENTLY published return (391) issued by the Board of Education deals with the application of funds by local authorities to education other than elementary in England and Wales during the school year 1904-5. The total expenditure, not including that of loans, reached £2,889,871, of which £736,966 was spent on secondary schools, with which pupil-teacher centres are classed. Of the latter amount, Wales spent £104,404. Towards the training of teachers, excluding pupil teachers, £48,835 was devoted, and the share of Wales under this heading reached £821 only. Nearly a quarter of a million pounds—of which Wales accounts for £13,278—went in scholarships, bursaries, and the payment of fees, and £152,605 was absorbed in administrative and legal expenses. About twice as much was devoted to evening schools, together with technical and other forms of higher education, as was expended on secondary schools. The report gives minute information

as to the amounts expended on different districts, and should prove a mine of wealth to the student of comparative educational statistics.

THE Civil Service Estimates for 1907-8 show an increase of £254,046 for the Board of Education, bringing the Education Vote up to £13,593,646. For secondary schools and pupil teachers the amount ear-marked reaches £691,000, an increase of £86,400 on the total of the previous year.

THE Board of Education has issued a list of twenty-five holiday courses which will be held on the Continent at different times during the present year, but mostly in the summer months. Six of the courses are in Germany, viz., Greifswald, Jena, Königsberg, Marburg, Neuwied, and Salzburg; four in Switzerland, viz., Geneva, Lausanne, Neuchâtel, and Bern; one in Spain, viz., Santander; and the rest in France, viz., Besançon, Dijon, Grenoble, Nancy, Boulogne-sur-Mer, St. Servan, St. Malo, Paris, Tours, Honfleur, Bayeux, Granville, Caen, Lisieux, and Villerville. The paper issued by the Board of Education gives the date of each course, the fees, return fares from London, lowest cost of boarding, principal subjects of instruction, address of the local secretary, and other details of importance to intending students. Copies of the paper can be obtained free on application to the Board of Education Library, St. Stephen's House, Cannon Row, London, S.W.

THE Teachers' Guild has published particulars of the Guild Holiday Courses for next summer. Courses are to be held at Tours, Honfleur, Neuwied, and Santander. The courses will commence in all four centres in the first week of August. The preliminary meetings at Tours, Honfleur, and Neuwied will be held on August 2nd. The courses will open on the morning of August 3rd in the French centres, and on the morning of August 5th at Neuwied. At Santander the students should arrive before August 5th. The courses will occupy less than three weeks. Students are advised to stay a short while longer in the country. It is about the end of the third week that consciousness of progress begins to be felt. Some further practice after this stage is reached is very valuable. The representatives of the English Committee in 1907 are: at Tours, Mr. Edward Buck, Christ's Hospital, West Horsham; at Honfleur, Mr. J. V. Saunders, Hymers College, Hull; at Neuwied, Mr. E. Sharwood Smith, the Grammar School, Newbury; to whom (according to the centre chosen) intending students should send their names as early as possible. At Santander, Señor Don Julian Fresneda de la Calzada, Santander, and Mr. S. Beirne, Astillero, Province of Santander, will act as representatives. Entries for the Spanish course should be made at the offices of the Guild, 74, Gower Street, London, W.C.

THE authorities of the University of Grenoble have sent us a detailed catalogue of the arrangements they have made for their holiday courses, which will last from July 1st to October 31st next. In addition to the summer courses, others lasting throughout the year and suitable for foreigners will be held. The courses in the phonetic laboratory, described in our issue for July, 1906, are to be held again this year, and are likely to be well attended by teachers anxious to improve their French pronunciation. Teachers thinking of visiting Grenoble should write to M. Marcel Reymond at the University.

M. CH. LAMBERT has sent us full particulars of the holiday courses for foreigners arranged at the University of Dijon. The courses will last from July 1st to

October 31st. The work arranged for visitors is of a practical kind, and has been made as interesting as possible. English visitors will find every arrangement has been made for their comfort. A booklet describing the University and the town, together with a copy of the list of lectures, can be obtained on application to M. Lambert at the University.

ON January 31st last a meeting was held in Paris of the friends and former pupils of the late M. Alexandre Beljame for the purpose of raising funds to perpetuate his memory by the erection of a medallion in the Sorbonne. During the many years that he held the professorship of English he trained the majority of those who are to-day teaching our language in France, and he probably did more to popularise the study of English than any other man. Among those on the committee appointed to forward this scheme are MM. Liard, Croiset, Hovelaque, Mézières, Garnier, Jamin, and Miss Williams. The secretaries are M. Clermont, of the Lycée Janson de Sailly, and Mlle. Scott, of the Lycée Molière, to whom all subscriptions should be sent.

THE proposal of the Manchester Education Committee to acquire the Platt Fields Estate at a cost of £130,000, for the purpose of erecting training colleges, to which reference was made in our February issue (p. 70), has been rejected by the City Council. It was urged by the opponents of the scheme that there was no guarantee that teachers trained largely at the expense of Manchester ratepayers would remain in the city to be available for service in Manchester schools. Until the training of teachers is regarded as a national duty this argument will continue to militate against an adequate supply of training colleges.

IT is reported that at Middlesbrough the Education Committee pays five of the masters in the boys' department of the High School, and all the assistant-mistresses in the girls' department, a smaller salary than the caretaker, who receives £143 8s. per annum. Among the teachers referred to are four graduates in science and two in arts. Do governing bodies in the north of Yorkshire consider education to be its own reward?

THE Association of Headmistresses recently forwarded a memorandum to the President of the Board of Education dealing with the question of afternoon work in secondary schools for girls. Answers received from schools belonging to the association in response to inquiries show that of 198 headmistresses, 29 were in favour of a compulsory afternoon session—though it should be pointed out that many of these headmistresses were influenced by special local circumstances—and 169 were against afternoon work. Similarly, 194 assistant-mistresses were in favour of work in the afternoon, and 1,619 against it. The memorandum in support of the opinions expressed by the schoolmistresses points out that Dr. Leslie Mackenzie has laid it down that: (1) Experience has shown that concentrated work with a long rest following and much individual freedom favours high tension of intellectual work; (2) it is sound psychology to rely on the fresh hours for the organising and developing of impressions, and to let a long rest intervene before preparation is begun.

THE views expressed at the International Conference on School Hygiene at Nürnberg, 1904, by Dr. Benda, of Berlin, and Dr. Hintzmann, of Elberfeld, also refer to the mental fatigue entailed by school work, and lend countenance to the opinions expressed in the memorandum. Dr. Benda maintains that the afternoons of several days

in the week should be free for gymnastics, sports, and games, as the claims of physical education are as important as those of intellectual education. Dr. Hintzmann urges that in order to lessen the over-pressure of teachers and pupils all instruction should be confined to the morning, except that required in gymnastics and games, and that the afternoons should be left free for home-work, music, and sports. He holds it proved that where this arrangement is tried, the pupils are brighter in class and more inclined to study at home, whilst the freedom from afternoon teaching has an equally beneficial effect upon the health of the teacher.

THE Education Committee of the West Riding County Council proposes to hold a short vacation course for teachers in secondary, technical, and elementary schools. The course will be held at the Municipal School, Scarborough, during the early part of August, and will last for about a fortnight; it is not limited to West Riding teachers, but will be open to all on payment of the fee. The aim of the course is to give teachers the opportunity of studying new methods of teaching ordinary subjects rather than to give specific instruction. The committee is not yet in a position to give details as to the lectures and lecturers, these questions being at present under consideration. The following subjects will probably be included, some of them being alternatives: Introduction to the study of education; voice production, singing, and methods of teaching singing in schools; teaching of elementary science, elementary mathematics, history, geography; school hygiene; nature-study; physical instruction. Further particulars will be ready early in May, and will be forwarded on application to Mr. A. V. Houghton, County Hall, Wakefield.

THE Royal Horticultural Society will hold an examination in Cottage and Allotment Gardening on April 24th, intended for and confined to elementary and technical school teachers. It has been undertaken in view of the increasing demand in country districts for schoolmasters competent to teach the elements of cottage gardening. The society's certificate will be issued to those who show sufficient acquaintance with the subject to warrant their teaching it. Teachers desiring to sit for the examination should apply at once for a copy of the syllabus, containing an entry form, to the secretary of the society, Vincent Square, Westminster.

THE director of public instruction in Afghanistan, Dr. Abdul Ghani, is at present occupied, the *Pioneer Mail* states, in establishing schools throughout Kabul, which he has divided, for educational purposes, into more than forty districts, each having a lower primary school. Out of these lower primary schools more than twenty upper primary schools, and from the latter five middle schools, are to be built up, which in due course will contribute to form two high schools in Kabul, besides the Habibia College, which prepares for degrees. Three years hence, schools are to be established on similar lines in large provincial towns.

A FRENCH edition of "Books for the Bairns" is being issued from the *Review of Reviews* office. The English edition of these booklets is, as is well known, sold at one penny, and it is proposed to sell the French edition at 2d. "Contes d'Enfants" has been published, and will be followed shortly by others.

MR. J. A. COOPER, B.Sc. (Lond.), senior mathematical master in the Widnes Secondary School, has been appointed principal of the Widnes Municipal Day Secondary and Technical School and Pupil Teacher Centre.

CANDIDATES for boy clerkships, of which particulars have appeared in THE SCHOOL WORLD (vol. viii., p. 308), must make application on or before April 11th. The usual examination for appointments as apprentices in the dockyards will be held in May. Forms must reach the Civil Service Commission on or before April 15th. Candidates must be between fourteen and sixteen years of age. The subjects of examination are arithmetic, English, geometry and algebra, elementary science, and drawing. The pay of apprentices increases from 4s. a week in the first year to 14s. a week in the sixth. The examination for artificers in the Royal Navy is to be held at the same time. The age limits are fifteen and sixteen years. The scope of the examination is similar.

MR. EDWARD ARNOLD directs our attention to an inaccuracy on p. 97 of our last issue. Our reviewer, writing of three volumes of the "Epochs of English Literature" series published by Mr. Arnold, refers to them as costing "eighteenpence the set." The volumes are sold at 1s. 6d. each.

SCOTTISH.

DR. STRUTHERS, secretary to the Scotch Education Department, has issued a circular with reference to the schemes of the French and Prussian Governments under which a number of young teachers in Scottish secondary schools may be employed in the secondary schools of France or Prussia for one year as temporary assistants. The general conditions are the same as in previous years, and those desiring fuller particulars should apply as early as possible to the Education Department. In a second circular dealing with French and German assistants in Scottish schools and colleges, Dr. Struthers points out that it will greatly assist the ultimate success and spread of a movement which, it is believed, may be of great value for the teaching of modern languages in all three countries if managers who are willing to make this experiment in a sympathetic spirit will submit a frank report at the close of the year upon the results that have been obtained, dealing with the difficulties that have occurred, and with the conditions that should, in their opinion, be fulfilled if the best use is to be made of these assistants.

THOUGH, to the disappointment of a large section of the public, no mention was made in the King's Speech of the subject of education in Scotland, the Secretary for Scotland introduced a Bill into the Commons on March 20th. In doing so, Mr. Sinclair explained that the Bill provides for school meals and the medical examination of children; confers on school boards power to make by-laws enforcing the attendance to a reasonable extent at continuation classes of backward pupils up to the age of seventeen; facilitates the transfer of insufficiently endowed voluntary schools to school boards; and abolishes the cumulative vote for school-board elections. The Labour Party proposes to bring forward an Education Bill of its own dealing with pretty much the same subjects, but from a different point of view.

THE Educational Institute of Scotland at its last general meeting approved of the principle of direct representation of its interests in the House of Commons, and instructed its general committee of management to prepare a return showing the financial burden that such a scheme would entail. This has now been done, and the scheme has come up for consideration before the various local branches. Almost without exception these have given a unanimous vote against the scheme. The one branch—Inverness—that has supported the principle of direct representation has also declared against any

additional levy for the upkeep of such a representative. Scottish teachers are apparently well satisfied with the intelligent and sympathetic interest the average Scottish member takes in education; and, judging by the strong support these have given to the plea for an improved superannuation committee, teachers have every reason to stand meanwhile by the *status quo*.

THE transference of the denominational training colleges to the Provincial Committees has been practically completed, and for the future these institutions will be national in name as they have long been national in function. The agreement that has been arrived at in regard to the teaching of religion should prove of considerable interest to English educationists in view of the movement for nationalising training colleges there. By this agreement the Churches undertake the entire charge of the religious instruction. They pay the teachers, they control the creed to be taught, they examine and decide, so far as religious subjects are concerned, on the merits of the students whom they teach. The Provincial Committees on their side guarantee that religion will have a place in the time-table of the colleges, and allow the Churches to employ, on such terms as were mutually agreed upon, the staff of the colleges to teach religion, should the Churches find suitable teachers among the staff. The price paid by the committees to the Churches for the existing colleges would, if capitalised, be more than ample for paying the salaries of those engaged in imparting religious instruction. It will thus be seen that, without a single word of opposition from any quarter, an agreement has been come to whereby the existing staff may be employed in the religious teaching. In England a similar proposal has been made a *casus belli* between two of the estates of the realm, and may result in a revolution in the constitution of the country. Certainly these things are managed better in Scotland.

IRISH.

THE number of students who have given notice of their intention to present themselves for the examinations of the Intermediate Board next June is the largest since the establishment of the system, viz., boys, 8,678; girls, 3,871; total, 12,549. This is an increase on the corresponding figures of last year of 359 boys and 486 girls; total, 845. As compared with 1905 the increase is 2,261.

THE Board's Rules for 1908 still excite considerable criticism, centring mainly round two points: (1) the necessity of passing in two languages besides English, and (2) the treatment of arithmetic, which is now amalgamated with algebra as one subject, the proportion of marks assigned to it being on the pass papers 30 per cent. and on the honours papers only 10 per cent. There is spreading a deep dissatisfaction with the present system, which the new rules have only intensified, and there is a very general feeling that it is useless to criticise or offer suggestions on the new rules, as these are only the result of an *impasse* at headquarters. *Quidquid delirant reges, plectuntur Achivi.* If the Government and the Commissioners are at loggerheads, it is the unfortunate schools, pupils, and teachers who must suffer.

WE trust Mr. Birrell will see his way to effect some radical improvement in Irish education. There has been enough of verbal sympathy with its shortcomings, and it requires considerable explanation to account for the difference between the figures for Irish education and those for England and Scotland. In 1901-2 the estimates for education were: England, £9,765,000; Scotland, £1,353,000;

Ireland, £1,301,000. For 1906-7 the figures were: England, £13,139,600; Scotland, £1,983,000; Ireland, £1,303,233. While the increase for England in five years is over 30 per cent., and for Scotland nearly 50 per cent., the figures for Ireland remain practically as they were. As some palliation Mr. Birrell says that the figures for Irish secondary education are not included, but as the income of the Intermediate Board has fallen about £10,000, this would not improve the comparison between the two years.

THE Association of Irish Schoolmistresses held its annual meeting at Alexandra College in February, when, after the election of officers, an interesting paper was read by Miss Tremain, mistress of method, on "Higher Education for Women at Home and Abroad."

THE January issue of *The Journal of the Department* (price 6d.) contains a large amount of varied and useful information on its work. It gives a full account of the meeting of the Council of Agriculture near the end of last year, with Sir Horace Plunket's address and defence of its policy. A good deal of space is given to the improvement of potatoes, to the nature of injurious orchard insects, and to experiments in flax. The Avondale Forestry Station is described in some detail. There are statistical tables of fisheries, of imports and exports from Ireland, and of emigration, of which the numbers continue to increase—31,270 for last year as against 27,189 for 1905. There are also tables giving the results of the local science and art examinations for 1906 (day and evening classes) in connection with the technical schools throughout the country.

A WHITE Paper was issued in March with the text of the Royal Warrant amending the statutes of the Royal University, providing the Senate power to deal with disturbances and violations of its regulations. The Senate is given authority to decline to award a pass at the examinations, to impose a fine not exceeding £5, to remove an undergraduate's name from the books, or to decline to allow him to enter for its examinations for as long as it is thought fit. Any person convicted of an indictable offence before entering for any examination must first obtain the express permission of the Senate.

THE Senate of the Royal University has held a special meeting to consider Mr. Bryce's University scheme. The resolutions the senators passed may be described as friendly neutrality, displaying an obvious desire not to commit themselves before seeing the scheme on paper. It is impossible to see what other attitude could have been adopted, especially as Mr. Bryce's proposals are said to be suffering considerable modification under the new régime. Their chief resolution runs: "That while the Senate feels that it was its right and duty, as long as the various plans for the settlement of the question of university education in Ireland were under consideration, to express its views clearly and strongly on the undesirability of establishing a single rigid system of university education, shaping the whole intellectual culture of the country in one mould, now that the outlines of a scheme have been put forward in the name of the Government with whom the responsibility rests, the Senate does not deem it proper to take any course which might prevent or obstruct the immediate removal of one of the greatest and most crying grievances under which the Irish people labour. . . . It cordially welcomes the announcement that the Government will take this question in hand during the present session of Parliament. That whilst the Senate is prepared to give the most careful and friendly consideration to the scheme of the Government when published in full detail, it submits the expression of its con-

viction that in any scheme which would involve the establishment of one or more federal universities, it is essential in order to avoid the evils of one stereotyped system of higher education that there should be granted to the federal colleges the largest amount of autonomy on the lines recommended by the Robertson Commission, and with practical unanimity by the recent Commission." Another resolution decried certain of Mr. Bryce's statements calling the Royal University a failure, pointing out that the candidates at its examinations in 1906 were 4,000, or nearly four times as many as on the rolls of the Trinity College; that many of its students hold distinguished positions in all parts of the British Empire; and that it can in no sense be described as a "mere examining board," considering its relation to the Queen's and other colleges.

On the other hand, a large meeting in Galway has protested against the exclusion of the Queen's College there from the scheme. A meeting in support of the attitude of Trinity College has been held in Cambridge, with Sir Robert Ball in the chair, and a resolution against Mr. Bryce's scheme carried on the motion of the Master of Trinity, seconded by the Master of Christ's. The Catholic Graduates and Undergraduates' Association, again, recognises in Mr. Bryce's scheme a solution in consonance with Catholic ideas and acceptable to the Irish people.

WELSH.

MR. A. T. DAVIES, the new secretary to the Welsh Board of Education, evidently appreciates the possibilities of the post to which he is called. He has declared himself as follows: "Wales is still aspiring after higher and better things under freer development of all that is best in her national life, and the need for wisely fostering instead of checking this is admitted by those in authority." He went on to say that it was to working out the problems in this connection that he had now received a call which meant his devoting to them the rest of his life, and he felt that he could desire no higher honour than to be placed at the head of a department of the State which had to do with the moulding of the lives and the shaping of the destinies of the thousands of little children in his fatherland. To be called to such work was, in his opinion, a much greater honour than to be the recipient of a coronet.

THIS is excellent, but the "moulding of the lives" is yet in a nearer, though still inexact, sense, in the hands of the teachers, and the question arises, what will the new department be able to do to improve the position of the teachers, so as to enable them to work with a due sense of security against the carking care of small remuneration, and to improve the conditions under which they have to work, particularly in the case of large classes? These are largely questions of finance. What will the new department be able to do in the way of inducing local education bodies to supply larger resources to effect these objects, and to equip teachers and scholars with all that is necessary for progress. Can the new department influence county councils to levy higher rates for educational purposes?

IT has been stated officially in the House of Commons that the expenditure of the new Welsh Department will continue under the supervision of the accountant general of the Board. It may be assumed that the scale of grants to the Welsh schools will remain at the same rate as English schools.

THE Aberdare Education Committee has decided to grant six scholarships of £10 each to teachers attending the summer school in handicraft at Barry. The Cardiganshire County Council has, during the last term, paid the expenses of country teachers attending a course of lectures in geography and methods of geography teaching at the University College of Wales, Aberystwyth.

THERE has been a discussion with regard to the action of the Pembrokeshire County Council in dealing with non-provided schools. The controversy has centred round the fact that the headmaster in a non-provided school, on the termination of his engagement, was, as it is urged, willing to accept his old post as a new appointment at a lower salary. This seems to have been a voluntary agreement, and nothing more need, therefore, be said about it. But in a speech of the chairman in justification of the committee, certain figures deserve to be quoted. He says: When the schools were taken over in 1904, the staff of the school numbered fourteen. Now it numbers seventeen. The salaries were (when the schools were taken over) £610, including what was paid in lieu of rent; to-day it is £709, an increase of £100. But the point of interest in the chairman's figures is this: in 1904 the average salary was £43 11s. 6d.; now the average is £41 14s. 1½d. The question, quite apart from the particular controversy, is: Can an education committee with a staff of seventeen teachers on the above average salary be considered to make adequate payment to members of a profession charged with the important work of training the young? Formerly, as a non-provided school, this was the responsibility of the managers. Now the responsibility is that of the Education Committee. If this is to be the view of the value of the services of teachers, what inducement is there in Wales or elsewhere for highly capable men and women to enter the profession of teachers?

MR. FRANK R. BENSON is advocating the desirability of a historical pageant for Denbighshire to "ennoble, educate, and recreate the people." He says: "Looking round Denbigh Castle, with its memories of the past, memories of public service such as have made our Empire what it is, I need not dwell on the effect to be produced by the mere recital of the history of its walls and their defenders."

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

A New French Grammar. By R. H. Allpress and J. Laffitte. viii + 188 pp. (Cassell.) 1s. 6d.—This grammar is intended for pupils who have already acquired some slight knowledge of French. It is more than the title implies; for it contains a reader and exercises in addition to the grammar. The passages in the reader are well selected. Mr. Millar's illustrations are often very good. The grammar is in English, clearly worded. The exercises consist of questions on the text in French, practice in applied grammar (especially to be commended), sentences for retranslation, and suggestions for free composition. In a note it is stated that words identical in French and English have been omitted from the vocabulary, but we find that "absorber, to absorb; accepter, to accept; admirer, to admire," &c., have been retained, while on p. 60 we counted ten words not included in the vocabulary, although we have not seen a statement that this page has been ignored in the compiling of the vocabulary.

A Skeleton French Grammar, with Exercises. By H. C. Atkins. viii+51+80 pp. (Blackie.) 2s.—The first edition of the exercises is now bound up with the second edition of the Grammar, in which a few slight alterations have been made.

German for Beginners. By L. Harcourt. Part I., vii+135 pp.; Part II., vii+220 pp. (Whittaker.) 1s. net and 2s. 6d. net.—This is the third edition, now issued in two parts, of a work which is the outcome of much experience. We recommend it to those teachers who are not already familiar with it.

L'Histoire d'une Tulipe, edited by T. R. N. Crofts, 94 pp., and *E. Laboulaye, Abdallah*, edited by J. A. Wilson, 80 pp. (Methuen.) 1s. each.—These are the opening volumes of a new series—Methuen's Simplified French Texts. The idea of issuing stories by standard authors in a simplified form is a good one, and these little books are welcome. Some teachers may regret the fact that a vocabulary is provided; the majority, however, will regard this as an advantage. The first story is an adaptation of Dumas's well-known tale "La Tulipe Noire," which has been skilfully reduced to about one-sixth of the original. The text is carefully printed. The other story is less familiar; it was, however, well worth editing, although the scenery is oriental, and not French. For neither book is the vocabulary quite complete; in the former we miss, for instance, *noir, interrompre, pot, vol,* and in the latter *casser, cueillir, cuivre, poussière, crier, vite.*

Corneille, Le Cid. Edited by H. W. Eve. xvi+143 pp. (Cambridge University Press.) 2s.—Any book edited by Mr. Eve is sure to be welcome, and this edition of "Le Cid" is no exception to the rule. The notes are quite admirable. If any fault is to be found with the introduction, it is that there is not quite enough of it. Thus fuller information about the *Querelle du Cid* and its effects on Corneille's development would have been valuable; and considering the ignorance of French prosody still prevailing in most of our schools, a note on the Alexandrine would not have been superfluous. We also miss the *Examen* which Corneille prefixed to the play.

C. Nodier, Les Quatre Talismans. Edited by W. G. Hartog. 70 pp. (Rivingtons.) 1s.—An oriental tale of some interest, with adequate notes and exercises of the kind usual in this series. Teachers using these books would probably be glad if the exercises in applied grammar and the *exercices écrits* were fuller. It seems a waste of space to include in the latter "Dictée" and "Réponses aux questions." If a little more trouble were given to these sections the readers would be much more useful.

Labiche, Lefranc et Jessé, Le Major Cravachon. Edited by W. G. Hartog. 62 pp. (Rivingtons.) 1s.—An amusing farce, with rather slight exercises and hardly any misprints, which is a distinctly novel feature in this series.

Madame de Baer, Michel Perrin. Edited by F. L. Carter. viii+87 pp. (Macmillan.) 1s.—This interesting tale has been well adapted and edited by Mr. Carter. The text is clearly printed, and the notes give much useful information. Sometimes, it is true, the phraseology is a little too learned, or actually clumsy. The vocabulary is complete. There is a brave array of appendices to suit all tastes: a *questionnaire*, then the familiar "words and phrases for *viva voce* drill," a key to which is supplied at the end of the book, exercises in applied grammar and

in retranslation, and passages for retranslation. The concessions made to reform teachers are a welcome sign of the times.

Jean Macé, Le Petit Ravageot. Edited by Dr. F. W. Wilson. vii+87 pp. (Macmillan.) 1s.—This, like the foregoing, is a volume in Mr. Siepmann's Primary French Series, and what has been said about "Michel Perrin" applies to this volume also, except that the notes are uniformly simple and straightforward. On the other hand, we have missed a few words in the vocabulary, such as *maitre, jouer.*

Classics.

The Story of Robinson Crusoe in Latin. Adapted from Daniel Defoe's famous book by G. F. Goffeaux. Edited, amended, and rearranged by P. A. Barnett. xii+118 pp. (Longmans.) 2s.—This book is welcome. Attractive readers for beginners in Latin are very scarce, and no boy can fail to be attracted by Robinson Crusoe. He will be doubly so if he has made Crusoe's acquaintance already in his native tongue. The book is well suited for rapid reading. It is a pity, however, that the spelling was not revised along with the text. The day has gone by when *j* could be used in Latin books, but here it is again. We should have preferred, also, that the long vowels should have been marked, since the book is meant for the early stages of Latin. A practical schoolmaster might therefore have made a better job of it; but nevertheless we are grateful.

First Book in Latin. By A. J. Inglis and V. Prettyman. xi+302 pp. (New York: The Macmillan Co.) 3s. 6d.—We can see no reason for the existence of this book. There are others of exactly the same kind, and the only advantage which this has over some is that long vowels (including concealed longs) are marked. The book consists of exercises on the Latin grammar, arranged as the grammar is arranged in a primer. Thus the first composition exercise is made on the first declension and the third persons present active of the first conjugation; and the unhappy boy has to exercise his wits on stupid sentences like *dea vocat, regina puellam laudat, femina deas laudat.* Many of the exercise phrases are not even sentences: e.g., *vita feminae, vitae feminarum, deae filia.* It may be a week before the schoolboy gets out of the region of the eternal feminine; and then he learns that *nauta Romanus de Gallis feris narrat.* We think it useless in so unintelligent a book to suggest improvements; but it may be well to point out that V is used as a consonant as well as I (p. 13).

Colloquia Latina, adapted from Erasmus. With Notes and Vocabulary by G. M. Edwards. xxiv+136 pp. (Cambridge University Press.) 1s. 6d.—We have again to thank Mr. Edwards for a school book in many respects admirable. The Colloquies of Erasmus, like those of Corderius and Vives, were written for use in schools, and the modern neglect of them is one of many signs that we have been following false lights in these latter days. It is impossible to read any of these books without realising that to the writers Latin was a living language. We are also amazed at the scope of the vocabulary, and the mastery of the language which they imply. Mr. Edwards has been obliged to suit our more feeble condition by greatly simplifying these; but the publication will do a great service if it helps to reinstate this noble tongue in its place. One book may lead to another, and perhaps the schoolmaster's attitude of mind may be made more natural. These racy dialogues cannot fail to interest

readers, and we hope they may be widely used. The chosen pieces are : On the Way to School, A Lecture on Manners, The Half Holiday, Young Athletes, Young Sportsmen, A Lazy Serving Man, A Cretan Rip van Winkle, The Wanderer's Return, The Dinner Party, Back from the Wars, The Shipwreck, The Drive to Antwerp, Erasmus and his Godson—a sufficient variety in truth. We wish there were no vocabulary; and there is another and more serious blot on the book in an analysis of syntax, which is quite out of place in a Reader.

An Alphabetical Encyclopedia of Institutions, Persons, Events, &c., of Ancient History and Geography. By Dr. Emil Reich. 224 pp. (Swan Sonnenschein.) 3s. 6d. net.—This book does not answer to its pretentious title. It contains very brief accounts of many of the names mentioned in classical books, usually two or three lines; Caesar has three pages, Cicero one, all the Claudii are compressed into one and a half. But we have failed to find any institutions: e.g., Senatus, Comitia, Ecclesia, Archon, Syssitia, are all absent, to take a few at random. The "Institutions, &c.," together with "some very famous names, especially in the world of letters and art," will (we are told) appear in another volume, an abridgment of Seyffert's Dictionary of Classical Antiquities. As far as it goes, the book may be found useful, but chiefly as a reminder to those who already know in general and wish to recall the particular. Thus of Damocles, we are told that he is "famous in connection with the incident of the sword hanging by a horsehair at the banquet given by Dionysius." Amongst the absent names are Constantine, Solon, Plato, Homer, Pheidias, Demosthenes; while Cato Censor has a page, Catiline nearly as much, Augustus one-third. Clearly it is not a scholarly book.

Damon: a Manual of Greek Iambic Composition. By J. H. Williams and Dr. W. H. D. Rouse. Third edition. 107 pp. (Blackie.) 2s. 6d. net.—We have seen no better book than this for teaching Greek verse composition. The pupil, being supposed to know how to scan, is at once brought to a sound, practical method of writing complete iambic lines. As the chief difficulty occurs in the middle of the line, this is tackled at once. The beginner is taught to build up his verse about the Baccchius and Cretic usually forming the second, third, and fourth feet, and then by resolving these he is led on to more complicated combinations. There are abundant original examples, well graduated, working up to leading articles from newspapers and propositions from Euclid. The chief fault we find is that the technical terms tend to become complicated, and chapter v., on the "Cretic at the end," is hard reading. The line at the head of ex. v. is not a good one; as an instance of the rule it is excluded by the general rule on p. 13. There is a good list of hints and helps on grammar and style, versification, and specialities of iambic prosody; but why is such an anomaly mentioned as a first person dual, or *τύπας* given as a typical first aor. partic.

Geography.

Europe and the British Isles. By Lilias Milroy. 196 pp.; maps. (Blackie.) 2s.—The author has written this book in readable fashion, and designed it for use in junior and middle forms. Each chapter is followed by a short summary of physical features and political facts, and an attempt is made to show the connection existing between the latter and the former. This connection, however, is neither insisted upon nor developed, as it should be, if it is to satisfy modern geography teachers. There are certain defects, too, which militate against the utility of the work.

There is no index; the maps do not illustrate points in the text, and are merely poor substitutes for those of the ordinary school atlas; and there are several statements here and there which, to say the least, require modification. Portland cement, for example, has no industrial affinity with Portland stone; olive trees are not found in any quantities on the Plain of Lombardy; all the rocks of the "Iron Gates" were not blown up; the Karst can hardly be considered as a purely Herzegovinian feature; and the Gulf Stream is not the determining factor of Norway's open harbours.

The British Empire. By F. D. Herbertson. 254 pp. (Black.) 2s. 6d.—This, the last issue of the "Descriptive Geography" series, is largely a compilation of extracts from the preceding six volumes. There are, however, several new "descriptions"—chiefly of occupations and industries—and the old plan of a formal introduction has been dispensed with. To take its place, Mrs. Herbertson has inserted short commentaries in leaded type, which serve the purpose of linking together the several extracts. The whole idea of the books—travellers' stories and original authorities—makes them the best geography "Readers" on the market, and as such we can safely recommend this or any other of the series.

The British Isles. By Prof. L. W. Lyde. 6th Edition. 128 pp. (Black.) 1s. 4d.—This is geography on the notebook system, and we like it. The six editions (in eight years) speak for others as well as ourselves, and bear silent witness to Prof. Lyde's reputation for accuracy and aptitude. In this new edition the paging is identical with that of the 5th edition, but several small additions have been made, and statistics (the reader is not troubled with much in this way) have been brought up to 1905. The "problem" paper at the end of the book is not particularly satisfactory. It is far too short and far too much like an ordinary examination paper.

An Introduction to Practical Geography. In Three Sections. By A. T. Simmons and H. Richardson. (Macmillan.) 1s. each section.—The issue of this deservedly praised and now well-known book in three separate sections at a moderate price is to be commended. As we reviewed the book in the March (1906) number of THE SCHOOL WORLD, and as our opinion of it, after a more intimate acquaintance than was then possible, is unaltered, there is no need to say more than that teachers of boys and girls of thirteen years and upwards—especially "upwards"—should get the book, whether in the full 3s. 6d. edition or in these separate 1s. parts. Section I. deals with "Maps" and map-making; Section II. with "The Globe" and mathematical geography; Section III. with "Climate" and climatic phenomena. Throughout the sections much, though not exclusive use is made of interesting exercises and problems.

Mathematics.

A First Statics. By C. S. Jackson and R. M. Milne. ix+380 pp. (Dent.) 4s. net.—The movement towards a change in the character of elementary text-books on mechanics is well represented in the book under notice. The first chapter does not consist of a discussion of the laws of motion, nor does it give a proof of the parallelogram of forces, but gives a clear statement of the principle of the lever, illustrated with many examples of a simple, practical kind. The next two chapters treat the resultant of two forces, graphically and analytically, and these are followed by a chapter on moments. Machines, work, efficiency, are taken up in chapter v., and friction

in chapter vi. A long chapter is devoted to centres of gravity; frames and link polygons are dealt with in two chapters. The penultimate chapter discusses the general conditions of equilibrium, while the last treats of forces in space. The mere enumeration of the contents, while showing the order in which the subject is treated, does not indicate the great variety of practical illustrations in which the book abounds, and which give it a character that differentiates it considerably from the older type of text-book. Though practical in its numerous applications, the book is thoroughly trustworthy as an introduction to the science of mechanics, and can be safely recommended to the attention of teachers who are in search of a good book for beginners.

Elementary Problem Papers. By Clement V. Durell. viii+120 pp. (Arnold.) 1s. 6d.—This collection of Problem Papers is stated to be intended for boys who have just finished the usual elementary course and are starting more advanced work. The various sets, seventy-eight in all, each containing eight questions, include several questions of greater interest than are usually to be found in such collections, and should prove of considerable value to teachers and to pupils who wish to test their knowledge in view of examinations or for recreation.

Geometrical Exercises. Parts i., ii., iii., iv. By L. Ashcroft. 32 pp. each part. (Arnold.) Paper covers, 4d. each part.—These Exercises are designed for classes which do not use a text-book. The leading theorems of plane geometry, including the geometry of similar figures, are printed in bold type; many of the questions, especially in part i., are exceedingly simple, and lead up to the consideration of the more elementary properties of geometrical figures; and ample practice in drawing diagrams is provided. For teachers who prefer to do without a text-book these Exercises may be useful.

The Teaching of Elementary Mechanics. 74 pp. (Macmillan.) 2s. net.—This book contains a report of the discussion at the meeting of the British Association at Johannesburg on the teaching of elementary mechanics, as well as a number of contributions sent to the editor, Prof. Perry, by several gentlemen who did not take part in the discussion; it also includes a paper by Mr. Ashford on "The Teaching of Mechanics by Experiment," which appeared in THE SCHOOL WORLD, vol. viii., pp. 335-9. The feature that strikes the reader of the book most forcibly is the divergence of views expressed by the various contributors; there is perhaps only one point on which all are agreed, namely, that in the earlier stages the study of mechanics must be based on experiment. There is, however, considerable difference of opinion on the question whether the study should begin with statics or kinetics. Of course, examinations and "academic methods" are subjected to fierce criticism, though Prof. Larmor's weighty remarks on examinations seem to us to be a much needed corrective to the too unmeasured denunciation of some of the contributors. In spite, however, of the great differences of view displayed in the book, it is a good sign that the teaching of such an important subject is being seriously debated by men of the greatest eminence in the scientific world, and nothing but good can follow from such discussion, though for the moment the "average" teacher, as well as the "average" boy, may be left in perplexity. It may be pointed out that several contributors lay great stress on the faculty of stating results in clear and accurate language; unfortunately, this faculty is but poorly developed in most pupils, and it requires time for its development. After

all, a thorough training in English is a necessity for the successful study of mechanics.

The Elements of Book-keeping. By M. Webster Jenkinson. viii+208 pp. (Arnold.) 1s. 6d.—A very clearly written book, thoroughly satisfactory as an introduction to the subject.

Modern Commercial Arithmetic. By Geo. H. Douglas. Part i. Elementary Stage. iii+163 pp. (Macmillan.) 1s. 6d.—A well-written book, with numerous examples of a practical kind, on the elementary subjects of commercial arithmetic.

Science and Technology.

A Method of Teaching Chemistry in Schools. By A. M. Hughes and R. Stern. xii+120 pp. (Cambridge University Press.) 3s. net.—Kipling has insisted that there are many ways of constructing tribal lays, each one of which is correct. Similarly, we surmise there are as many satisfactory methods of introducing young pupils to the study of chemistry as there are experienced and well-trained teachers. The only real test of the merits of the course of work outlined in this book is to try it with an average class. Though we recognise the freshness of treatment of a familiar subject and the indications the book affords of the skill of the mistresses who have compiled it, we are disposed to think that most teachers will prefer to follow the line of research already adopted in most school laboratories. At the same time, the earnest science teacher, responsible for the work of elementary pupils, should obtain and study the lessons contained in this volume.

Life and Evolution. By F. W. Headley. (Duckworth) 8s.—This book is the outcome of lectures to Haileybury boys, and is written in an easy and, at times, colloquial style that should secure for it a wide circle of readers. Mr. Headley begins at the bottom of the tree of life, and takes us by steps, some of them rather long, up to the mind of man. We are inclined to find fault with the title: except in dealing with reptiles and birds, there is little of evolution in these pages: progress in plenty, but not evolution in the usual sense. The author holds somewhat heretical opinions about moulds (*mucor*) and bacteria, regarding them as "in the main animals"; nor will all biologists agree with him as to the priority of plants in the appearance of life upon earth. A few misstatements of facts occur: *Cordylophora* thrives elsewhere in the Broads than at Hickling; we have ourselves found it in the River Ant at Irstead; the teeth of *Hyrax* can hardly be described "as those of a rabbit"; *Lacerta vivipara* does not leave her young to their fate, she accompanies her family for some weeks; we should be glad to have some evidence in support of the statement that whales underwent a sudden denudation of hair. Attention may be directed to a few misprints: p. 79, *Plesiosauris*; Fig. 49, caracoid; p. 108, nob (bis); p. 134, four lines from bottom, shows for show; p. 245, *Pisum sativum*. But these slips do not detract from the general excellence and readability of the volume.

(1) *A Health Reader.* I. By Dr. C. E. Shelly and E. Stenhouse. 160 pp. (Macmillan.) 1s.

(2) *Hygiene and Temperance.* By Florence L. Mather. 127 pp. (Nelson.) 1s.

(3) *Good Health.* I. By Dr. F. G. Jewett. 172 pp. (Ginn.) 2s.

(4) *Good Health.* I. By F. H. Shoosmith. 47 pp. (Charles and Dible.) 2s. per dozen.

These four little books are one and all admirable both in intention and execution. The elementary facts of human

physiology are set forth in plain, straightforward language such as a child can understand, and their bearing on rules of life and conduct are clearly explained.

Dr. Shelly and Mr. Stenhouse cover the whole ground in their volume, and have succeeded in presenting their story without employing a single difficult or unfamiliar word. We regret that in the account of respiration they speak of "sucking" the air into the lungs, and make no mention of atmospheric pressure as the cause of the inrush of air. "Sucking" always seems to put the effective force at the wrong end.

Miss Mather's book is intended for teachers and higher classes, and treats the subject from a more domestic point of view.

Dr. Jewett's "Good Health," which forms part of the Gulick Hygiene Series, is an American work. Its style, allusions, and narrated episodes are so entirely Transatlantic that, excellent as it is, it is hardly likely to be much used in this country.

Mr. Shoosmith's similarly titled booklet is concerned only with breathing and circulation. The account is very well written; but there is one curious omission, viz., the importance of inhaling through the nostrils and not through the open mouth. This book is a marvel of cheapness, but is printed in good clear type and is well illustrated.

A Text Book of Botany: Part I., The Anatomy of Flowering Plants. By M. Yates. 147 pp. (Whittaker.)—This book is little more than a profusely illustrated glossary of botanical terms. Twenty years ago it might have become popular; to-day its chief readers will probably be those—they still survive here and there—who think a knowledge of botany consists in the ability to describe a plant in technical language.

MISCELLANEOUS.

Education and National Progress. Essays and Addresses, 1870-1905. By Sir Norman Lockyer, K.C.B. xi+269 pp. (Macmillan.) 5s. net.—The publication of this volume serves to remind us how much higher education owes to the assiduous and persistent advocacy by Sir Norman Lockyer of the need for scientific habits of thought in all forms of human activity. Throughout the long period covered by these essays he has not ceased to urge upon British statesmen that the best preparation for peace and war is a scientifically graded scheme of national education, so fashioned as to form an organised whole from the elementary school to the university. Many of the reforms for which Sir Norman Lockyer and other men of science pleaded in the early 'seventies have long been adopted; but though these efforts have been felt in many directions and a great deal has been accomplished, there is much these pioneers have taught us still to be done so far as secondary and higher education are concerned. The methods of science have permeated pedagogic practice; and, even in schools where science as such meets with scant regard, linguistic subjects are taught in accordance with the most approved scientific methods. In these essays there is no wish expressed to oust literary subjects from the curriculum; the plea is rather for a well-balanced scheme of work in which the humanities and science unite to assist the production of well-educated citizens. We cordially commend the volume to the attention of teachers.

The Magic Whistle and other Fairy-tale Plays. By Frank Nesbit. 156 pp. (Longmans.) 2s. 6d. net.—These plays are neither better nor worse than others of their kind. Any person of average intelligence could, by taking a little thought, turn any fairy-tale into an actable play

for children. For fairy-tales have the advantage of possessing a ready-made beginning, middle, and end. Nor is it difficult, with practice, to invent such dialogue as the following:

"*Fairy Godmother.* Now, your Majesty, didn't you say that whoever should make the Princess laugh should marry her?"

King. Yes, old lady, I believe I did.

Fairy Godmother. Then (pointing to Jack) here is her husband.

King. Oh, come now, I really can't give her to him. Why, I don't even know who he is."

There is no objection to such pieces being learnt and acted by children at home during the holidays. But it is a pity to offer such dramatic pabulum to school pupils. The time spent in learning by heart words that are not in any sense literary can be ill spared in these days of an overcrowded curriculum. However, we would not be too hard on plays that can well serve as matter for amusement on wet days and birthdays. Mr. Nesbit has at least not attempted to be too funny, or to appeal to the grown-up understanding while he is amusing the young.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

PESSIMISM IN EDUCATION.

THE true interest of Prof. Armstrong's panegyric of "Plain Reading" in the March number of THE SCHOOL WORLD lies in the profound scepticism of the writer as to the value of any directive influence in education. Under the guise of a recommendation to teachers and controlling authorities, Prof. Armstrong expresses opinions which can only be taken to mean that, at least in so far as any cultivation of the humanities is concerned, he despairs of the teacher, and despairs of the school. "The vast majority of our teachers cannot expound the beauties of our classics with advantage." "The average teacher simply cannot understand, say, 'In Memoriam.'" Such are the assumptions with which he sets out, and he takes for granted that the ordinary literature lessons may be fairly described as "the dreary repetition by a semi- or demi-semi-competent teacher of somebody's pedantic, if not sacrilegious, annotations of one of Shakespeare's plays." There is likely to be a grain of justice in any charge, however extravagant; and the article in question might not have been without its use as a forcible protest against methods of teaching that are as yet by no means wholly discredited, if the indictment had been accompanied by any helpful suggestion tending to improve existing conditions. But the writer's proposals are essentially destructive in their tendency. The teacher is apparently to efface himself until his influence practically disappears. He is not even to choose the reading-books, and, indeed, there will be little left for him except to pass them round to his pupils, and perhaps to exercise some police regulation as to their use. The next logical step would be to declare the school a useless institution in regard to all studies, such as literature and history, that rest mainly upon books. Though Prof. Armstrong has not explicitly followed out his argument to this conclusion, readers of his article cannot fail to see the drift of his suggestions.

A criticism so ruthless, which brings an indictment

against a whole profession, and attacks the greater part of the educational machinery in which the capital of every civilised country has been sunk, would have to be supported by very weighty reasons. It will be worth while to examine closely those which Prof. Armstrong presents. But a serious difficulty arises at the outset, for it is impossible to make out with any certainty from the terms of the article what the writer really means by the "plain reading" which he recommends. There are, I take it, four conceivable interpretations of the phrase. It may be meant that we should prefer (1) matter to style, or (2) informative to imaginative literature, or (3) books about *things*, in the narrower sense, to books about people, or (4) books fancied by the pupils to those chosen for them according to any standard. Which of these, if any, is the sense in which Prof. Armstrong uses the words? The trouble is that, to judge from the expressions in his article, he means at once all and none of them. When we read his warnings against the seductions of "mere word-painting," and are told to "learn to think more of the stuff in it—of the subject-matter of the literature we prescribe," we take it to be the first of the possible meanings that is intended, but presently we have the safeguarding proviso: "Far be it from me to discourage either the study of words or the reading of classic literature." Then, when such works as Morris's "Earthly Paradise" are condemned, and "all the fairy-tales together, all the heathen myths," are unfavourably compared with "the great book of Nature," we naturally think that "plain reading" is opposed to imaginative literature; but presently we find Hugh Miller's praise of the Iliad and the Odyssey as children's books quoted with approval. Again, the reiterated suggestion that school reading should be mostly concerned with geology and kindred sciences would seem hostile to any preoccupation with history, biography, or fiction; yet "Treasure Island" is recommended on the ground that it is "just full of human nature." Lastly, there are numerous injunctions to withdraw all control over the reading of young people, either at school or at home, and to leave the choice entirely to chance or the random fancy of the readers. "Browse on books, early and late; almost any books, all the books that you can get hold of." But we are also told that "the number of readable books giving sound and accurate information is very small." Presumably the boys and girls are to discover this small number laboriously for themselves. "If it be in them, in time they will learn to separate wheat from chaff." Yet it is not even clear whether the teacher is to have any part in the matter or not. On the one hand, it is laid down that "the stream of English literature should be allowed to flow pure and undefiled through the youthful mind." But "what is read should be criticised—the authority should always be asked for." Is the teacher to listen submissively to the criticisms of the pupils, or will he be allowed occasionally to put in a word of his own? It would certainly seem that Prof. Armstrong does not know his own mind, or at least that he has not the courage of his convictions in any one of the directions that he is inclined to pursue.

Let us, however, put on one side all the inconsistencies of the article, real or apparent, and try to get at the real inwardness of the writer's attitude. It is pretty clear, despite his protests, that the world of reality to which alone Prof. Armstrong would be genuinely interested in introducing young people is the inorganic world. He would allow this interest to bulk by far the most largely in every school curriculum, not only filling up the hours

of practical work, but absorbing most, if not all, of the time assigned to the study of books. He is intolerant of the distinctively human interest. He sees little educational value in any pictures of the past that are not concerned with material conditions as reproduced by the methods of physical science. To him, striking characters such as Warren Hastings and Clive and Frederick the Great, who represent great historical movements, are only "bores," and he cannot imagine how an account of them could have any attraction for young people. He apparently has not read Macaulay's "Essay on Frederick the Great" recently, or he could not have forgotten how racy and sparkling a narrative it is.

Imaginative works are rated no more highly. Shakespeare's plays apparently deserve no serious study; it is enough to see one occasionally represented on the stage. This is not the place to fight the battle of the humanities over again. No one can deny the value of the impetus given to the direct study of nature in our schools by Prof. Armstrong and other thinkers of the same type, but when there is any question of the apportionment of time and effort in a comprehensive school course, the opinion of extremists can count for very little.

More striking than Prof. Armstrong's scientific bias is his attitude towards teachers and schools, which can only be described as educational nihilism. It is not only that he has a poor opinion of them as they are at present; his scheme of things would really leave no worthy place for them under any conceivable conditions. He apparently does not believe in class teaching at all. Boys and girls are, it would seem, to educate themselves for the most part, and what they cannot do alone is to be effected by some tutorial system which would involve the exclusive attention of a teacher to a single pupil, or at most to a group of two or three. Surely this is idealism run mad! It is as easy as it is profitless to frame utopias that bear no relation to necessary economic conditions. If education is to be a possession of the people at all, children must be taught in numbers, and any suggestions for the improvement of schools must reckon with that supreme fact. The fallacy that runs through the whole of Prof. Armstrong's argument lies in the assumption that the average boy or girl is a serious and eager student, who will not only study diligently such books as are really suited to their stage of development, but will plough through any number of books by way of experiment until they reach the select few that satisfy their wants. It is all very well to say, "It matters little what is read, so long as the habit of reading seriously and acquisitively be gained." How is this habit to be gained? Does Prof. Armstrong know so little of children as to imagine that they can be trusted to acquire it for themselves without even the slightest guidance from more experienced readers? Even if all young people had ready access to a well-stocked library, the greater number would rarely enter it at all except under compulsion, and of those who did venture inside, the majority would be satisfied with the most frivolous books they could find, and would never develop a taste for any other class of literature, unless through some outside influence. The chance of prescribing certain reading for school purposes is in most cases the only available means of raising the natural taste to a higher level. It is, of course, desirable that the guidance should savour as little as possible of constraint, and that every effort should be made to lead young people into higher realms of culture by the pleasantest paths. What is put before them must not be so far beyond their present taste and capacity as to repel them, but if there is to be

any assured progress, it should always be of a higher class than the majority would have chosen for themselves. In the article suggesting certain courses of school reading which called forth Prof. Armstrong's pronouncement, this was the object kept in view, and it is a matter of fair debate whether the proposed scheme should be modified or extended. But it is too late in the day to revert to educational anarchy in regard to the literary treasures of the ages which it is the privilege of each generation to open up to their successors. The time-honoured and plausible notion of turning children into a library to browse at their own sweet will, which Prof. Armstrong seeks to recommend anew, would prove disastrous in nineteen cases out of twenty. A large measure of individual choice is not incompatible with the exercise of some persuasive and even authoritative guidance, and teachers will have little hesitation in making full use of the opportunities which their position affords them.

JAMES OLIPHANT.

I HAVE TO thank the editors of THE SCHOOL WORLD for an advance proof of the above letter. I fear that even Mr. Oliphant has scarcely learnt to read, judging from the interpretation he gives to many of my sentences; he has certainly failed to appreciate the object of my article. He had given us advice as to the best authors for school reading: I ventured to suggest that his list was a dreary and narrow one from the schoolboy's point of view—that he was aiming at too high an object and going too slowly—that the primary need was instruction in the simple art of reading, not the dull dissection of books which grown-ups are pleased to regard as classics. I insisted also on the need of an effective correlation of literary with practical studies. His answer is to call me a pessimist.

My criticism is "ruthless" and "brings an indictment against a whole profession." Is it not then an acknowledged fact that we do not know how to teach English? Has not an association for the promotion of English teaching been established recently—subscription 5s, less a reduction to those who come in by a side entry? Surely, a shameful enough confession of impotence, this! "Strange though it seems, English literature is a new subject in Public Schools. We are largely in the stage of experiment." I quote from one of the essays written for *The Times*.

Again, my criticism "attacks the greater part of the educational machinery in which the capital of every civilised country has been sunk." Has not the introduction of electricity led to the entire setting aside of machinery in which vast sums had been sunk? Will not the adoption of a similar policy be a necessary consequence of the introduction of Common Sense into education? I have already mildly suggested—in my Moseley report—that it would be well if we scrapped the whole wretched academic show and started afresh. Are we to scrap machinery only in the interests of shareholders? Surely, human souls are of some consequence!

Something must be done to curb the so-called teacher, so that the pupil may have leisure and opportunity to learn. The Dean of Durham commences a charming essay "Of Education as an Instrument for Deadening the Human Intellect," in the February number of the *Parent's Review*, by quoting the words of Comenius (1627): "May the guiding star and rudder of our Didactic be this: to search out a rule after which *Teachers may teach less and scholars may learn more!*" And it is noteworthy that the Dean also writes—"Let us teach languages in the more natural ways."

If the boy at school were heard, would he not often exclaim to the teacher—"Do be quiet, don't talk so much—don't ask such silly questions and give such feeble explanations—do let me read quietly and do something myself—give me time to think for myself—don't ask me to do something fresh every half hour or so?" The class of teacher Mr. Oliphant represents forget that the outlook of men from thirty to fifty years old is not that of boys of ten to fifteen years. I implied that Warren Hastings and Clive and Frederick the Great were bores to most boys, who care nothing for polities. What if Macaulay's essay on Frederick the Great be racy and sparkling (not "educative in the highest sense of the term," be it noted)—to grown-up men who know something of the world? "Deeds that won the Empire" and "Bail Up" are far more likely to be regarded as racy and sparkling by boys. While on Macaulay, let me suggest that Mr. Oliphant is perhaps not familiar with his essay on Lord Bacon—I would ask him to read it and to note how poor, in Macaulay's opinion, have been the services rendered by the humanists in comparison with those of the exponents of the Baconian philosophy of utilitarianism.

"Does Prof. Armstrong know so little of children," &c.—perhaps he knows more than Mr. Oliphant supposes. His opinion certainly is that their intelligence is beyond that of most teachers and that their faults are to a far less extent congenital than a consequence of the inane teaching to which they are subjected at school. Thring is worth consulting on this point. The thing the average teacher understands least is the boy—the only person who has less understanding of him is the examiner. This could not be more clearly shown than it is in the English paper set at the recent Matriculation Examination of the University of London—a more damnable production cannot be imagined (cf. Ruskin, "Sesame and Lilies," par. 18)—suitable perhaps for the D.Lit. but not for children of the age of sixteen or thereabouts. No better illustration could be given how not to teach English in school.

The literary teachers have had possession of the schools these generations past and to what state have they brought us? To the verge of intellectual bankruptcy! They have disregarded the new knowledge entirely and have not made the attempt even to teach their pupils to read—instead they have revelled in pedantic verbalism. I am optimist enough to believe that at no distant date the nation will see to it that the work of education be entrusted to men with a more practical outlook—to men who can lead their pupils to know both themselves and the world, in accordance with the advice tendered by that prince of humanists, Matthew Arnold, some thirty years ago.

As to the use of books, it were well if we could pay heed to the "Complaint of Books" put forward by Bishop de Bury somewhere about 1300: "O idle fishermen, using only the nets of others, which when torn it is all ye can do to clumsily repair but can net no new ones of your own! ye enter on the labours of others, ye repeat the lessons of others, ye mouth with theatric effort the superficially repeated wisdom of others. As the silly parrot imitates the words he has heard, so such men are mere reciters of all but authors of nothing, imitating Balaam's ass, which, though senseless of itself, yet became eloquent of speech and the teacher of its master though a prophet. Recover yourselves O poor in Christ and studiously regard us books, without which ye can never be properly shod in the preparation of the Gospel of Peace . . . books implore of you: make your young men, who though ignorant are apt of intellect, apply themselves to study. . . ."

HENRY E. ARMSTRONG.

Catechetical Teaching.

THE welcome appearance of Sir Oliver Lodge's new Catechism raises the question whether a catechism is the most effective method of teaching anything to the young. I suppose that years ago all sorts of useful knowledge in science, geography, history, and so on, were taught by catechisms, such as Mangnall's "Questions." And that since then even greater emphasis has been put on the method of teaching by question and answer. A book on arithmetic consists almost entirely of questions; but we generally keep the answers *confidential until our pupils have made some serious struggle with the questions for themselves*. Is not a question a stimulus to thought, an answer a sedative?

Again, many of us use questions in our laboratory teaching of experimental science. "What gases, if any, are produced when (a) zinc dust and (b) bleaching powder are separately heated in test-tubes?" If, after experimenting, our pupils persistently answer "(a) hydrogen and (b) oxygen," we turn again to our test-tubes, and find results surprising and instructive, which would certainly have escaped us if we had taught *ex cathedra* or from a book.

Hence one cannot help wondering whether it might not be useful to suppress the answers to questions in other fields, especially when it is alleged that the answers to be sought depend ultimately upon evidence and upon experience. Indeed, one may even have a vision of the passive resister and the high churchman both agreeing to public education "on the basis of the catechism," the questions only to be supplied to the child. We are none the less grateful to Sir Oliver Lodge for his suggestive Key for the use of parents and teachers.

HUGH RICHARDSON.

Bootham School, York.

HAVING seen Mr. Richardson's letter, through the courtesy of the editors, I should like to add that in my judgment a catechism should in the first instance be only in the hands of the teacher, and that the children should be given an opportunity of understanding and considering any serious question before an answer is supplied by authority. Their minds should be skilfully made ready to welcome each answer when it is given; but never should they be expected to construct for themselves what the teacher may consider to be the correct answer. Their attention should be concentrated on the real issue, not on what someone else may happen to be thinking about that issue. The spontaneous ideas of unsophisticated children are often interesting, and are certainly helpful to a teacher.

As to the amount of time and opportunity that can wisely be given to any one question, that must depend on its nature; some can be answered in the laboratory or the garden, some with the aid of books of reference, and some (and perhaps these are the most educative) by the unaided action of the child's mind on its own store of experience. For instance, such a question as "What is the distinctive character of manhood?" or "In what ways does man differ from other animals?" could be so best answered, and answers of this kind are best obtained in a lively *viva-voce* manner. It is usually only questions of empirical fact, such as occur in subjects akin to history and geography and language, that must be looked up in books.

But there are fundamental questions in philosophy and religion, such as children sometimes spontaneously ask or can easily be interested in, to which answers must

ultimately be given from the point of view of an enlarged experience; it being understood that we are all groping our way in these matters, and that adults do not pretend to infallibility when they help children towards what they conceive to be the truth. It is such questions as these on which a carefully drafted set of formal answers can gradually and judiciously be administered. In some cases such answers may legitimately be learned by heart, even when the full meaning can only subsequently dawn upon the budding intelligence; though it is clear that such a method must be employed with caution. Questions dealt with at length should usually have some intrinsic interest and importance of their own, or else should be a natural outcome of a lesson: applying in detail, and to special cases, that which has been given in general principles.

It would be wearisome, however, to adhere exclusively to the method of instruction by question; sometimes there should be instruction by lecture also, but never unless the spirit of inquisitiveness is alive.

OLIVER LODGE.

University of Birmingham.

Epidemics in Day Schools.

A QUESTION on which light is urgently needed is that of epidemics of the milder diseases. Until one is brought face to face with an outbreak, one cannot realise how hopelessly authorities differ. A single instance will suffice of a matter which came prominently under the writer's notice some years ago. There happened to be in a small town a somewhat extensive epidemic of measles, and the question of quarantine became serious. Four local doctors were consulted as to the extent of time necessary for a boy to be isolated after the first symptoms showed themselves. Each one differed entirely in his views. One actually demanded six weeks as the minimum time; another stated that three weeks was quite sufficient. Both were mild cases. In his perplexity, the writer had recourse to what he considered the best books on the subject. He consulted three. No. 1 said that in a mild case a pupil might return to school on the fifteenth day after infection; No. 2 regarded three weeks as the minimum time; No. 3 was equally positive that a month was necessary. What was a worried headmaster to do? After much pondering, the wisest course appeared to be to throw the whole responsibility upon the doctors, and to ask them in each case to state that the patient might return to school without danger of infecting other boys. Practically every doctor declined to sign the document, asserting that it was impossible to state exactly *when* there was no further danger of infection. Obviously, therefore, the whole matter had to be left to the arbitrament of chance and to the conscience of the individual parent.

Surely this is not creditable to medical science. However, this is a minor difficulty to that which one experiences when there is a question of a boy who already has had an illness coming to school from a house where the disease exists. Nearly every authority asserts that it is impossible, except in rare cases, to have the same disease twice. (The diseases referred to are measles, whooping-cough, chicken-pox, mumps, and scarlet fever.) Nevertheless, in a not very long experience, the present writer has come upon numbers of cases where it has been positively asserted that a boy has had the same disease two or three times. No doubt this is often due to the confusion between German and English measles, but even allowing for this error it seems impossible for a layman, at any rate, to doubt that second attacks do occur more often than is asserted. That is, however, not the important point.

What should be decided without a shadow of doubt is whether a boy, not himself ill, can carry the germs from those infected to those at present immune. Practically every authority asserts that he can, and on *a priori* evidence the fact should be certain. Yet it seems that there is grave reason to doubt whether the chance is not so slight that it can usually be neglected.

The working of a day school becomes so quickly and hopelessly disorganised by an epidemic, that if it could be established that only the actually ill pupils need be kept away considerable relief would be experienced. It is no use relying on isolation in a private house. In the homes from which most day pupils come facilities for such treatment are practically non-existent. Consequently, one of two courses must be adopted. Either all the children from an infected house must be rigorously excluded so long as there is the slightest infection, or all should be allowed to come except those actually ill. The former course is (theoretically) adopted by 99 per cent. of principals of schools. The word "theoretically" is used advisedly, for one becomes very sceptical as to whether it is always carried out. Many of these diseases have now become so mild that the doctor is not called in at all, and when he is called in the mischief is done. The germs are already in the school. The infection is present. May it not be reasonably asked whether it is not lost labour to exclude the "well" pupils? Certainly in the experience of one headmaster this course has been adopted with such success that he is rapidly becoming very sceptical as to the utility of the conventional methods. A little common sense on this question seems to be urgently needed. If the "well" persons do carry the infection, exactly what infection does the doctor himself carry? How many children who are excluded from schools are also excluded from churches or other places of worship? They cannot possibly be confined to the house. Over and over again, children rigorously excluded from associating with their fellow-pupils in school have been seen playing with them in the streets or sitting next to them in churches. Are we not in our present system straining at a gnat and swallowing whole droves of camels?

The policy of the open window in the schools, the continual preaching and teaching the gospel of fresh air, seem to be of far higher importance than the meticulous regulations usually insisted upon by authority. Apparently the medical profession acquiesce in the continued necessity for such diseases as measles and mumps and whooping-cough. At the same time, they preach the need to guard against infection from them. What often happens? A child carefully guarded against these diseases in his childhood is sent to a big boarding school, where he promptly catches them one after the other, with a result that his work is seriously hindered and the disease is rendered far more severe than it would have been in early youth. Sometimes one is forced to think that if the money spent on public isolation hospitals and school sanatoria were spent on inculcating the elementary principles of sanitation and fresh air far more good would be done, and the diseases stamped out in time.

However, this is a digression. The somewhat heretical views put forward here are advanced with fear and trembling in the hope that they may perhaps elicit sensible recommendations from persons of experience and authority. The problem is a most vexatious one; and the present system would seem to entail a maximum of vexation with a minimum of efficiency.

HEADMASTER.

Dr. Rouse's "First Greek Course."

I HAVE to thank your critic for his corrections of certain oversights in my "First Greek Course." The rule for comparison, however, which he desires to alter (p. 10), is correct for *πικρός* and *πυκνός* as for *μικρός*, the syllable (not the vowel) being "long" or heavy in all these. It might be more clearly put, however. I do not think the rule as to relations of space (p. 19) implies that the cases can always be used alone in these senses; a similar rule is given for Latin, where prepositions generally have to be used, and I assume a knowledge of Latin. The accent of contracted adjectives is not as he states, so far as I am aware (see Jelf's "Greek Grammar," i., p. 127, for example). *ἀνώγεων* does no harm in a conspectus as complement to *κάλως*. *λελύκω,* *λελύκοιμι*, or rather corresponding forms in other perfect stems, are sometimes wanted. I should be glad of some clear evidence to decide between neut. *ἐστώς* *ἐστός*, *Βεβώς* **Βεβός*; what evidence I know is not to my mind decisive. *γεγώς* is strong in favour of *Βεβώς* but the quantity in *ἐστώς* may make a difference. The balance of probability is, I think, in favour of what I have given.

W. H. D. ROUSE.

To take Dr. Rouse's points *seriatim*. A short vowel before a mute followed by a liquid or nasal does not make a long syllable; the first syllable of *μικρός* is long because the *ι* is long, and similarly the first syllables of *πικρός* and *πυκνός* are short because the vowels are short. The rule for the formation of comparatives requires a slight enlargement, therefore, to cover these words. I still think the rule about the accusative (p. 23, not p. 19) is likely to mislead; the words are, "generally speaking, motion towards is expressed by the accusative." A knowledge of Latin might lead a boy to use the accusative with towns and small islands, and to insert prepositions with other words. The author's meaning seems to be that when motion to is expressed, the preposition is used with the accusative. For the accent of contracted adjectives I must refer to Kühner-Blass, I., 1, § 115, 3(a), where the rule is given, "nach der bestimmten Lehre der alten Grammatiker." Dr. Rouse himself prints *νά*, *δστώ*; then why not *ἀπλώ*? *ἀνώγεων* may do no harm, but what good does it do when neither it nor any word like it occurs? Is it not part of the useless lumber which it is desirable to jettison? The point about *λελύκω* and *λελύκοιμι* is that such forms are rare, the usual forms of the perfect subjunctive and opt. active being of the type *λελυκώς* *δ*, *εην* and these should be given in preference to the others. The best MSS. are said to give the form *ἐστός*; see Kühner-Blass, I., 2, § 317, 3.

THE REVIEWER.

The Metric System.

MR. WYKE BAYLISS's article in the March number of THE SCHOOL WORLD came most opportunely just before the Bill for the enforcement of metric units was introduced. The difficulty of teaching the metric terminology to a class was not so great in my experience as he seems to find it. There is hardly anything which a boy cannot forget in the holidays, but this, at all events, comes back to him in a very few minutes. Now that so much geometrical work is done with a graduated ruler, he is pretty sure to remember the relations of deci-, centi-, and millimetre. The estimation of lengths of common objects at sight will increase his range. If his teacher gives him plenty of practice *viva voce* in all manner of re-

ductions, this drill will soon fix the nomenclature in his head, and will also establish the view that it is the figures that are moved, not the decimal point. By "plenty of practice" I mean five or ten minutes every arithmetic lesson for some weeks.

We shall not know how easy and natural the metric system is until we have improved our teaching of decimals. May I here protest against Mr. Bayliss's phrase (p. 86, seventh line from foot) "introduced to decimals," when he means to decimal fractions?

I was delighted to find last year a school in the far west of Ireland where decimal fractions were taught as an extension of decimal integers, and in consequence their use gave no trouble, to a class still ignorant of vulgar fractions. They had fully grasped the meaning of "place value," and worked their multiplications as Mr. Bayliss does, integral and fractional alike. Division presents somewhat more difficulty, even to those so taught. If to place the figures of the quotient without modifying the position of those in the divisor and dividend is not attainable by a dull class, the best way, I believe, is to shift the divisor so that its highest digit is in the units place, shifting the dividend, of course, to the same extent.

But as soon as the ideas of area and volume can be treated—and with the help of the model litre Mr. Bayliss describes (p. 88) that may be quite early—so soon do the real merits of the metric system appear. Get a boy who has been hampered and confused by our British no-system of units to measure a rectangular vessel in metric units, and calculate the volume it contains in litres and the weight of such a volume of water in kilograms, and he will need no farther exhibition of the merits of the metric system to make him an ardent advocate for its adoption.

The suggestion that even our monetary system can be brought under the decimal spell is at least as old as de Morgan. More than thirty years' experience of his method established my conviction that the saving for all considerable calculations is very great—an idea which is, I believe, taking hold on the mercantile world. May I end with an expression of horror at the suggestion (p. 87) that "every type of question in which approximation is possible" should be illustrated by examples? There are few things more dangerous to sound and profitable arithmetical teaching than an excess of worked examples—but this, no doubt, Mr. Bayliss knows as well as I.

FRANK E. MARSHALL.

WHILST gratified by Mr. Marshall's friendly criticism, and pleased that he has so few faults to find, I should like to point out that in some places he has misunderstood my meaning. The *viva voce* "drill" is just what I contended was necessary to fix the nomenclature. Nevertheless I have known even men, accustomed to reckon in metres and centimetres, temporarily "floored" by a question stated in decimetres or dekametres; and as to boys!—there is perhaps no commoner question on their lips than "How many centimetres are there in a decimetre?" unless it be "How many cubic centimetres are there in a litre?"

Again, technically Mr. Marshall is right in speaking of "decimal fractions"; practically the additional word "fractions" only confuses a boy.

Once more, my suggestion was that children, having made counters representing £ s. d., and pounds, florins, and mils, should be taught to make exchanges from the one system to the other. No doubt the idea might be traced to de Morgan; but has the experiment ever been tried?

Lastly, Mr. Marshall's "horror" at my supposed suggestion is only excelled by my own at discovering that my words are capable of such an interpretation. Of course I meant that, at every stage of their work, boys should be set questions which do not, as they say, "come out," so that they may be driven to use approximations. But I gather that Mr. Marshall thinks such questions should be called "exercises" instead of "examples." Is not this somewhat hypercritical? I have just picked up a dozen text-books by different authors. In nine of these the questions are all called "examples"; in one they are headed "calculations"; in two only are they entitled "exercises." If the above suggestion is the only one that arouses horror, I shall indeed believe that the metric system is on the verge of victory.

R. W. B.

Greek for Beginners.

PROF. CONWAY'S letter in your last issue seems likely to create a false impression as to the teaching of Greek to beginners at the City of London School under Dr. Abbott. Greek was begun in the fourth form, and in the fourth and fifth Euripides, Plato (the *Apology*), and Lucian were read. A boy would have been learning Greek for eighteen months or two years before he entered the sixth, and it was only then that he began Thucydides, of whom he read one book straight through every year. He did not read selections. He could not, I think, strictly be called a beginner at this stage.

C. L. S.

The Balance Hydrometer.

In the March number of THE SCHOOL WORLD, Mr. E. T. Bucknell describes a method of finding the density of a body by means of a hydrometer without using weights.

Nine years ago (*Education*, June 11th, 1898) I described a somewhat similar, but far simpler, method of finding densities by flotation.

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WALTER HARRIS.

Longton, Staffs.

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SIXPENCE.

APPROXIMATIONS AND CONTRACTED METHODS IN ARITHMETIC.

By F. E. ROBINSON, M.A.
St. Paul's School, London.

DURING the last few years the teaching of elementary mathematics has been so thoroughly renovated that but little of the original structure remains. Euclid has gone: results obtained by actual measurement of drawings made to scale are treated as of an importance equal to those proved by formal demonstration. The manipulation of trigonometrical formulæ has given place to more direct calculations involving much numerical work. Graphs and the numerical evaluation of formulæ have almost entirely displaced the algebra which concerned itself chiefly with symbols. Whether these changes are for better or for worse, they undoubtedly demand as an indispensable adjunct great facility in arithmetical calculation. No one can fail to perceive that the old arithmetical methods are not adapted to these new purposes. The too frequent dependence on vulgar fractions, based on the assurance that the numbers have been cunningly chosen so as to cancel out beautifully in the end, the long division sums which always finish off with no remainder, the conscientious struggles after absolute accuracy long after the figures employed have any practical meaning, entirely unfit the pupil to work with numbers not chosen with a view to a neat answer, or to deal with quantities subject to errors of observation, or to obtain within a reasonable space and time a result correct only so far as correctness is useful.

To meet the new requirements certain modes of calculation, usually called contracted methods, have been dragged from an obscurity in which they have long languished as curious specimens of perverted ingenuity. Examiners have placed in the forefront of their demands a knowledge of these methods, and regularly complain in their reports that such is not forthcoming. Committees of experts have investigated the processes, and have recommended their immediate adoption. The writers of text-books have responded by devoting considerable space to the exposition of the methods, and what was once thought to be

sufficiently treated in a disconnected section, probably marked for omission, is now become one of the chief attractions of an up-to-date book. Yet it seems very doubtful whether, on the part of the teachers, there is any real enthusiasm for, or belief in, the utility of these much-belauded improvements; and the boys certainly show little inclination to apply them. Writing to the *Mathematical Gazette* in May, 1906, with respect to these methods, a mathematical teacher says that, though he taught these rules for many years with enthusiasm, he never used them himself, or induced any boy to use them except for the purpose of gaining marks. He came to the conclusion that they were but toys, and he cut them out of the curriculum. Many teachers hold similar views, and boys usually regard contracted methods merely as an additional item to be got up for examination purposes. So long as teachers have so little faith in the new methods that they do not personally make any practical use of them, and so long as boys find in them such difficulties that they cannot put them to any practical use, no real progress is likely to be made. We will therefore, before considering them in detail, discuss whether such practical use is a possibility.

The words "contracted" and "shortened" convey to the mind a very misleading notion as to the real object aimed at by the employment of the new methods: their great merit, in our opinion, is that the work is arranged so as to enable the operator to reject at any stage figures which are useless for the purpose required. If there are no such figures, this fact must not be attributed to a failure of the method. It is a frequent source of disappointment to find that, after employing a method specially learnt to save labour, the work is no less than it would have been by another process with which we are more familiar. As this is the gist of most of the complaints that are made as to the unsuitability of these new methods for practical use, we will examine what foundation there is for such opinions. In the old method, which most people use ordinarily, we multiply first by the figure of lowest place-value, each successive partial product being shifted one place to the left. Thus it is clear that a person who habitu-

ally multiplies by the old method, which was established when no such things as contractions were contemplated, must make a considerable mental exertion, and proceed slowly and warily when he wishes to contract. The whole process is unfamiliar to him: he is obliged to stop and go through mental calculations as to the place-value of the figures, or to ransack his memory to recall rules, which are laid down for beginners in the earliest stages.

It is not surprising that boys who try to use contracted methods in this way come to the conclusion that the "short" method is longer than the "long" one, and that it is responsible for such a multitude of blunders that they dare not employ it in practice. The methods of contraction are founded on the supposition that the operator usually multiplies first by the figure of *highest*, instead of the lowest, place-value. Whatever may be the merits or demerits of such methods to persons who fulfil the initial conditions, we can well believe that they are of no use to persons for whom they were never intended. If it can be shown that to the beginner this style of multiplication presents difficulties, which are inherent to the method and are not present in the other style; if it can be established that boys, who are taught this method *ab initio*, and continue to use it habitually, are slower and more inaccurate than those who proceed on the good old plan; then we will willingly concede that these contracted methods are not worth the time wasted on their acquirement. Otherwise the case stands thus: if no contraction be possible, the boy performs an ordinary multiplication; if contraction be possible, he does essentially the same, omitting those figures which he can see will be of no use.

The loose way in which the word approximately is frequently used is responsible for much of the distrust of the actual use of the methods. To a boy who has been accustomed to obtain answers correct to the minutest fraction, a process where any figures are ignored seems barely entitled to his respect; consequently he is either ready to impute to the process all the errors which he may himself make, or he takes the opposite view, and imagines that if only his actual working is correct he ought to get a correct answer, despite the errors introduced into the process by indiscriminate contraction. These erroneous notions are due to his failing to observe in what way the figures which are admittedly approximate affect the result obtained.

It should be clearly understood that the phrase "approximately correct" has a definite meaning, and it should not be used to palliate errors. It implies absolute accuracy to one figure more than is written down. If, for example, a number is given to be 32·34, it is to be understood that this differs from the true value by a quantity less than 0·005, i.e., that the true value lies between 32·335 and 32·345. Similarly, the value of 345,637 is 345,600 correct to four significant

figures, since it differs from the true value by less than 50. Thus for a given number of significant figures there is only one number which is approximately correct, and that is the number which is nearer to the true value than any other number expressed by the same number of significant figures. All quantities which are the result of direct measurement are approximately correct in this sense. Thus, if we are given that the diameter of a sphere is 11·3 cm., it is implied that the true length lies between 11·25 cm. and 11·35 cm.

If n such numbers, each correct to four decimal places, be added together, the error in the result is less than $\pm 0\cdot00005 \times n$; thus, if $n=4$, the last figure may be in error by 2. In working with four-figure logarithms, which are only approximately correct to four places of decimals, such errors are frequent and unavoidable, and we cannot therefore rely on the fourth significant figure of a result obtained from them. In such cases, unless improved data are available, there is nothing to be done but to recognise that the result is liable to slight error the limits of which may be stated. But where the approximations are made by the operator, the error can be eliminated by retaining in the working two more figures than are required in the result. If $n=20$, the first discarded figure might be in error by 1, but this would not affect the result unless the discarded figure were 4 or 5. Thus, if two extra figures are retained, we are practically safe from any error within the desired limits.

In subtracting two numbers, each correct to four places, the possible error is $\pm 0\cdot00005 \times 2$, i.e., $\pm 0\cdot0001$. To avoid error the same precaution must be adopted as in the case of addition.

When two numbers which are given correct are to be multiplied together so as to give an answer approximately correct to only a certain number of figures, the same precautions as in the case of addition must be again adopted. The partial products are formed approximately correct to two more figures than are required correct in the result, so that, when these partial products are added, the result is free from error within the prescribed limits. In order that the partial products may be approximately correct, the approximate carrying figure from the first figure not included in the product must be added. Thus, from $2 \times 7 (=14)$ we would carry 1, but from $2 \times 8 (=16)$ we would carry 2. These principles are common to all methods of contracted multiplication, but the details of arrangement differ widely.

The object of the process is, of course, to avoid writing down figures which are not required; but we should not attempt to achieve this object by a violent perversion of the ordinary method. Multiplication of integers, of decimals, and the contracted form should differ in arrangement as little as possible. In the examples given below the arrangement is based on two rules:

- (1) The unit's figure of the multiplier is to be

placed under the last figure of the multiplicand.

(2) The right-hand figure of each partial product is to be placed under that figure of the multiplier to the use of which it is due. In the contracted form the only change introduced is that we regard the last figure to be retained as the actual last figure, and we omit all figures in the partial products which fall to the right of it.

<i>Integers.</i>	<i>Decimals.</i>	<i>Contracted Form.</i>
34567	34·567	34·567
2435	24·35	24·35
—	—	—
69134	691·34	691·34
138268	138·268	138·27
103701	10·370 1	10·37
172835	1·728 35	1·73
—	—	—
84170645	841·706 45	842·

In text-books exact rules are given for placing the partial products, but these are intended only for beginners. The pupil should be able to contract his work at any stage when he sees that he is going to obtain figures which will be useless to him. Unless he can do this readily and without elaborate preparations, he will not find the rules for contraction of much practical use.

In division, too, the same principles are employed. The contraction is effected by cutting off one figure from the divisor instead of, as usual, bringing down a figure from the dividend. The number of figures in the divisor thus diminishes by one for every figure obtained in the quotient. The process can safely be applied at the stage in which the number of figures still to be found in the quotient is two less than the number of figures in the divisor. If at the beginning there are more figures in the divisor than are required in the quotient, it is only necessary to retain in the divisor one more than we require in the quotient, and the divisor should be at once curtailed. As an example, we will consider the following :

The imports for 1906 (to the end of October) were valued at £497,645,568, which is an increase of £38,581,739 over the value for 1905: find the increase per cent. to two decimal places.

$$\begin{array}{r} \text{Value in 1905} = \underline{\underline{\mathcal{L}497.645.568}} \\ \quad - \underline{\underline{\mathcal{L}38.581.739}} \\ \quad = \underline{\underline{\mathcal{L}459.063.829}} \end{array} \qquad \begin{array}{r} 8.404 \\ 45906\mid 38)385817\mid 39 \\ \quad \quad \quad \backslash\backslash \\ \quad \quad \quad 367250 \end{array}$$

$$\text{Rate of increase per cent.} = \frac{38581739}{4590638.29} = 8.40$$

In order to apply these methods to questions involving British money, it is necessary to express the money as the decimal of a pound. To find an answer correct to the nearest farthing it is sufficient to obtain it in pounds correct to three decimal places, so that five decimal places must generally be retained in the working. If, however, the given amount is to be divided by a number greater than unity, or is to be multiplied by a proper fraction, we need only retain three decimal places, for the error in the result

will be less than that in the original approximation. Such exceptional cases occur in long division and in simple interest. But even five places are not sufficient to retain in the original decimal if in the course of the work there happens to be a multiplication by any number greater than 10, unless the operation is to be followed by a subsequent division by a number larger than that multiplier.

In all calculations involving decimals it is of the utmost importance that the results of each operation should be checked by a rough approximation to the answer. If this be done before we start upon the actual work, it is nearly impossible to make a mistake in the position of the decimal point, for a comparison of the first partial product or the first figure of the quotient with the rough approximation will at once disclose any error which may have been made in the initial arrangements. The numbers chosen for the rough approximation should be so simple as to reduce the chances of error in it to a minimum.

As an instance of the practical use of the rules for contraction, we may point out that data which are the results of actual measurement are subject to errors of observation, so that any calculation based on such quantities must also be liable to error. In these cases it is not only permissible, but logically necessary, to use contracted processes, for it is obviously foolish to pretend to greater accuracy than the imperfection of the data renders possible.

If a is a quantity subject to a small error x , its true value must lie between $a+x$ and $a-x$. If b is another quantity subject to a small error y , the value of the product ab will lie between $(a+x)(b+y)$ and $(a-x)(b-y)$.

Thus, the error in the product

$$= (a \pm x)(b \pm y) - ab = \pm(bx + ay) \text{ nearly.}$$

If the sides of a rectangle are given to be 97 m. and 64 m. to the nearest metre respectively, the possible error in the area

$$= \pm(64 \times 0.5 + 97 \times 0.5) \text{ sq. m.} = \pm 80 \text{ sq. m. nearly.}$$

By multiplying 97 by 64 we obtain 6,208 square metres for the area; but since this is subject to an error of ± 80 sq. m., it is clear that all we can truly say is that the actual area lies between 6,288 sq. m. and 6,128 sq. m.

The error per cent. in the product ab

$$= \pm \frac{(bx+ay)100}{ab} = \pm \left(\frac{x}{a} + \frac{y}{b} \right)100.$$

The true value of the quotient the arithmetical value of which is a/b must lie between $\frac{a+x}{b-y}$ and $\frac{a-x}{b+y}$

Hence the error in the quotient a/b

$$= \frac{a+x}{b+y} - \frac{a}{b} = \pm \frac{bx+ay}{b^2} \text{ nearly.}$$

The error per cent. in the quotient

$$= \pm \frac{bx+ay}{b^2} \times \frac{100b}{a} = \pm \left(\frac{x}{a} + \frac{y}{b} \right) 100.$$

These results can be extended and combined;

thus, if a, b, c, d be subject to errors $\alpha, \beta, \gamma, \delta$ respectively, the error per cent. in ab/cd is

$$\pm 100 \left(\frac{\alpha}{a} + \frac{\beta}{b} + \frac{\gamma}{c} + \frac{\delta}{d} \right).$$

We have alluded to the errors introduced into calculations by the use of four-figure logarithms; but as these errors are frequently less than those which are independent of the mode of calculation employed, logarithms are still of great utility when applied to such numbers as we have been considering. Thus, if the diameter of a sphere is measured to be 11·43 cm., its volume, calculated by multiplication, is found to be 781·9 c.cm.; and by using four-figure logarithms we obtain 781·4 c.cm. for the result; but the error in the volume due to imperfection of the data is $\pm 1\cdot026$ c.cm.; hence the discrepancy in the results given above is of no practical importance. But when the data are not imperfect and when accuracy to more than three figures is required, it will be clear that four-figure logarithms must not be used.

The theorem that, when $n+1$ figures of a square root have been found by the ordinary process, n more figures can be found by division is proved in text-books on algebra, but its application is useful chiefly in arithmetic. The following example will sufficiently illustrate the method, and will also show the importance of expressing all surd quantities with rational denominators before commencing the arithmetical calculation.

Find, correct to 10 figures, the value of $\frac{1}{\sqrt{5}+1}$.

$$\begin{array}{r}
 2 \quad 2 \quad 3 \quad 6 \quad 0 \quad 6 \quad 7 \quad 9 \quad 7 \quad 7 \quad 5 \\
 \hline
 5 \quad | \quad & & & & & & & & & \\
 4 \quad | \quad & & & & & & & & & \\
 42 \quad 100 \quad & & & & & & & & & \\
 84 \quad & & & & & & & & & \\
 413 \quad 1000 \quad & & & & & & & & & \\
 1329 \quad & & & & & & & & & \\
 4466 \quad 27100 \quad & & & & & & & & & \\
 26706 \quad & & & & & & & & & \\
 447206 \quad 3040000 \quad & & & & & & & & & \\
 2683236 \quad & & & & & & & & & \\
 447212 \quad 3567640 \quad & & & & & & & & & \\
 3130484 \quad & & & & & & & & & \\
 437156 \quad & & & & & & & & & \\
 402191 \quad & & & & & & & & & \\
 3465 \quad & & & & & & & & & \\
 31305 \quad & & & & & & & & & \\
 3360 \quad & & & & & & & & & \\
 3131 \quad & & & & & & & & & \\
 229 \quad & & & & & & & & & \\
 224 \quad & & & & & & & & &
 \end{array}$$

$$\begin{aligned}
 \frac{1}{\sqrt{5}+1} &= \frac{\sqrt{5}-1}{(\sqrt{5})^2-1} = \frac{\sqrt{5}-1}{4} \\
 &= \frac{1}{4} \times 1\cdot2360679775 \\
 &= 0\cdot3090169944
 \end{aligned}$$

The calculation of the value of an infinite convergent series correct to a certain number of decimal places affords a good example of the true meaning of approximation. Orderly arrangement is absolutely necessary; only thus can the pupil see exactly how each term affects the result, and why certain terms may be neglected. The following specimen of such a calculation will illustrate the point.

Find, correct to 10 decimal places, the value of π , given that

$$\pi = 4\left(\frac{1}{3}\right) - \frac{1}{3}\left(\frac{1}{3}\right)^3 + \frac{1}{3}\left(\frac{1}{3}\right)^5 - \dots - \left\{ \left(\frac{1}{2\cdot56}\right) - \frac{1}{2\cdot56}\left(\frac{1}{2\cdot56}\right)^3 \dots \right\}$$

Denote the first series by A and the second by B , so that $\pi = 4A - B$.

CALCULATION OF A .

Positive Terms.	Negative Terms.
$\frac{1}{3} = 0\cdot300000000000$	$\frac{1}{3}\left(\frac{1}{3}\right)^3 = 0\cdot002666666666$
$\frac{1}{3}\left(\frac{1}{3}\right)^3 = 0\cdot000064000000$	$\frac{1}{3}\left(\frac{1}{3}\right)^5 = 0\cdot000001828571$
$\frac{1}{3}\left(\frac{1}{3}\right)^5 = 0\cdot00000056888$	$\frac{1}{3}\left(\frac{1}{3}\right)^7 = 0\cdot00000001862$
$\frac{1}{3}\left(\frac{1}{3}\right)^7 = 0\cdot0000000063$	$\frac{1}{3}\left(\frac{1}{3}\right)^9 = 0\cdot0000000002$
Sum = 0·300064056951	Sum = 0·002668497101
Neg. sum = 0·002668497101	
	$\therefore A = 0\cdot197395559850$

CALCULATION OF B .

Positive Terms.	Negative Term.
$\frac{1}{3} = 0\cdot004184100418$	$\frac{1}{3}\left(\frac{1}{3}\right)^3 = 0\cdot000000244116$
Neg. term = 0·000000244116	
	$\therefore B = 0\cdot004184076002$
	$\pi = 4A - B$
	$= + 0\cdot789582239400$
	$- 0\cdot004184076002$
	$= 0\cdot785398163398$
	$\therefore \pi = 3\cdot141592653592$

Thus $\pi = 3\cdot1415926536$, correct to 10 decimal places.

THE NATURAL HISTORY OF ANIMALS.

HOW TO TEACH THE NEW SUBJECT OF THE CAMBRIDGE LOCAL EXAMINATIONS.

By OSWALD H. LATTER, M.A.
Charterhouse, Godalming.

I.

THE recent introduction of animal natural history into the junior and senior Cambridge Local examinations renders it probable that candidates will desire to be prepared in this subject, and that some teachers will be glad of a few hints as to the general mode of procedure. An inspection of the published syllabus shows that considerable latitude is permitted; so that no teacher need feel constrained to make any attempt to cover the entire ground there planned out, nor will the endeavour so to do be made in these articles.

It must be stated at the outset that although the syllabus appears to deal solely with structure and habits, and although physiology and hygiene form a separate subject in the examinations, yet it is absolutely impossible satisfactorily to deal with structure in the total absence of knowledge of function. The arrangement, disposition, and form of organs is, at the elementary stage, a subject devoid of interest and lacking in stimulating suggestion—dry bones in very truth. To make these bones live, the quickening breath of function must enter into the teaching. This, indeed, is evidently felt by those who set the examination papers; for in a specimen paper before us there occur such purely physiological questions as: “What is the course of the blood through the body of a mammal? What purposes are served

by the circulation of the blood?" and, "Describe . . . the use of the gills of a fish." I would, therefore, begin the course of teaching with one or two lessons mainly physiological in character; and inasmuch as the chief energies of animals are directed towards the acquisition of food, these introductory lessons might follow some such course as the following :

(i) The general purpose of digestion, and the necessity of rendering possible the passage of food from the cavities of the digestive organs into the blood.

(ii) The function of the blood as a carrier of food and of oxygen, and, further, as a scavenger collecting the waste products, and conveying these to the lungs, skin, and kidneys for removal.

(iii) The connexion of bones with muscles, and the mechanical principles involved in their movement.

In these introductory lessons the human body is the best object for reference, being already more or less familiar, and forming an easy starting point when the "general structure of a mammal" is taken in hand.

It will be convenient for the purpose of these articles to group the animals comprised in the syllabus into two sets, viz., Invertebrates and Vertebrates. On the present occasion we will confine our attention to the former. Among these the snail, cockroach, earthworm, moth or butterfly are specified for junior candidates, while seniors are, in addition, expected to have an acquaintance with the jelly-fish, sea anemone, mussel, crab, and star-fish among marine forms, and (probably in practice or) with hydra, the pond-mussel, crayfish, a gnat, a spider, among fresh-water and terrestrial animals.

Perhaps it is hardly necessary to insist that knowledge of these "types" should be gained, as far as possible, by direct observation of the living animal, and as little as need be from books or lectures; but my excuse for dwelling on this caution lies in the fact that it is a strong temptation both to the teacher and to the candidate to adopt the seemingly more rapid method of preparing for an examination. To any who may be thus tempted, I would point out that mere book-knowledge is of very small value, and will produce no permanent result: it cannot arouse any real or fruitful interest, and it entirely fails to give the kind of training aimed at by the introduction of this subject into the examination in question. Undoubtedly the practical method is slow, but it is also sure. Nor must we overlook the impossibility of conducting the whole of the observational work upon the captive living animal: in some instances this may be feasible, but in most it will be necessary to observe the animal in its natural state, free and unfettered.

Let us take as an example the common earthworm. If a few fully grown earthworms are brought alive into the class-room, the children will without difficulty be able to note and describe the segmented and roughly cylindrical form of the body, its tapering anterior

and posterior ends, the curious flattening of the hinder portion of the body, the deeper colour that is evident on the anterior segments, and the presence of the thickened girdle at about one-third of the length from the anterior end. If the worm is placed on some soil in a box or pot, the alternate lengthening and contraction of successive regions of the body will be seen to take place as the animal crawls, and the value of the extremely finely-tapered head may become evident if the animal is so far obliging as to burrow into the soil. The effect of placing a worm on a hard polished surface, such as glass, at once makes it clear that a worm travels most easily over rough surfaces; and then, if the worm be held between the fingers at the level of the eye, the bristles by which a hold is obtained upon superficial irregularities spring into view, and a very fairly complete idea of the mode of locomotion has been obtained. But it is necessary also to see how the earthworm conducts itself when under natural conditions in or at the mouth of its burrow. On almost every lawn or other stretch of short grass, worms may be seen extended beyond their burrows during a warm, moist summer evening, or perhaps more conveniently in the early mornings of the autumn months; nor does it require much patience for anyone to observe how or on what the animal feeds, and the means which it adopts to protect and conceal the entry to the burrow. An attempt to seize one such worm will at once reveal the value of the peculiarly flattened tail as a sure anchor firmly pressed against the sides of the burrow, and, moreover, will impress the mind with the protective function of the slime, and with the great strength of the longitudinal muscles of the body wall. In the syllabus the internal anatomy is not mentioned, but in teaching some reference to the locomotor muscles can hardly be avoided; and those candidates who proceed further with the subject will be able, in the light of this small piece of field work, readily to understand why the longitudinal are so very much thicker than the circular muscles—a small point neglected by all the text-books! Further observations on the economic importance of earthworms may be made by collecting and weighing a given number of worm-castings, and by counting the number of such castings on a given area. These notes should be supplemented by systematic records of the work accomplished by single specimens kept under as natural conditions as possible in large flower-pots filled with soil.

I have dealt at some length with this animal in order to emphasise what is true of the study of all animals, namely, the necessity of seeing the living animal in its natural home. Perhaps it may be asked: what is the best way of ensuring that pupils shall see for themselves? Are we to take them out into the field and there point out what can be seen, or are they to be told to go and look for themselves, and write out an account of what they discover? A combination of the suggested alternatives is probably the best. After as much as is possible has been done in the class-room, the

teacher should give out a set of questions that are to be answered from observations in the field. For example: "What are the worms doing on the surface of the earth? On what do they feed? How do they seize their food? Can they see, or hear? What do they do when alarmed? How are they able to escape from danger?" and so on. Then the class should, if possible, be taken to a suitable spot at a suitable time, and in the presence of the teacher jot down brief answers to the questions. These answers may subsequently be used as the foundation of a consecutive account of the habits and structure of the earthworm, written out as an essay or examination answer in the permanent note-book. I need hardly add that all such accounts should be illustrated by the pupil's own drawings.

In the same way, acquaintance with the external features and mode of life of the other invertebrate animals should be gained as far as possible from direct personal observation, guided by appropriate sets of questions. Snails are very tolerant of captivity; the rhythmic opening and closing of the mouth of the lung chamber can be seen without difficulty; if the animal be caused to crawl up a glass surface (*e.g.*, inside a lamp chimney), the undulatory contractions of the muscular foot become quite evident, and leave their impression upon the slime trail that marks the route followed. The mode of using the jaw and radula is more easily made out in water-snails than in the land species, for the former frequently browse upon the microscopic green weeds that will grow upon the glass sides of fresh-water aquaria; on such occasions the radula and jaw can be seen scraping against the glass. But for the hibernating habits, the formation of the epiphragm, the deposition of eggs, and the general behaviour under varying conditions of weather, the pupil must go out of doors.

The fresh-water aquarium is a necessity: it need not be very large or costly; in fact, for hydra a glass tumbler, for gnat larvæ a saucer, and for crayfish a large pie-dish will serve the purpose; and since these receptacles are easy of access, there should be no difficulty in providing a number commensurate with the number of pupils. On the other hand, the pond-mussel demands a larger vessel, with some two inches or more of mud and sand at the bottom, and sufficient depth of water completely to cover the animal when vertical, but not much more than this. A depth of about four inches of water is enough; if it be much more the deeper layers of water become deficient in oxygen and the mussels die. I have kept mussels alive and in good health for over two years in such shallow water as here suggested, and have been able to observe their modes of locomotion both forward and backward, and also the emission of their young. To secure this last successfully, it is necessary to keep a few small fish, such as sticklebacks or minnows, in the aquarium with the mussels; and in any case, to obtain satisfactory observations of any of the habits of the mussel, the aquarium must be placed

where it will be free from vibrations of the floor, and must be approached softly; otherwise the mussels are disturbed by the shaking, and "shut up" determinedly. No doubt several of these fresh-water animals may be kept together in one and the same aquarium, but it is advisable to give the crayfish a place to itself, for it will sooner or later devour nearly all the other occupants.

All these animals can be obtained at very reasonable prices from Mr. T. Bolton, 25, Balsall Heath Road, Birmingham; but it is better, whenever possible, to obtain them during an expedition organised *ad hoc*. Hydra can be found in many clean ponds and ditches, but is difficult to see; the best way to obtain it is to bring home several bottles full of water and pond-weeds, turn out the contents into a larger vessel that can be easily examined, and then next day search for hydræ, especially on that side of the vessel which is best illuminated. Gnats' eggs and grubs abound during summer in water butts and similar places; several species are sure to be found in the mud at the bottom of a stagnant pond. The presence of mussels in ponds is usually indicated by empty shells on the banks; the animals can be obtained by the use of a long-handled rake, or, if visible, by a strong landing-net. Crayfish occur in many streams and rivers draining calcareous soils; they can be caught by placing at the bottom of the water weighted circular nets baited with a piece of herring (not too fresh) in the centre; strings must be arranged so that the net can be pulled up in a horizontal position. The favourite spots are near stone walls, wooden piles, and similar structures which afford sheltering recesses. In the captive crayfish the processes of feeding, breathing, and of locomotion can be readily observed.

The marine aquarium is less easy to manage, at any rate at inland places; but even here it is possible on a quite small scale, for the majority of the marine animals will live for a considerable time in artificial sea-water. This can be provided by dissolving Tidman's sea-salt in ordinary water, making the strength of the solution such that its specific gravity is the same as that of average sea-water, namely, 1·028. Sea-weeds must, of course, be placed in the water.

The rearing of moths and butterflies is probably the most widely practised of all natural history pursuits; but very few boys or girls pay sufficient attention to the behaviour of their insect pets. If the caterpillar turns to a chrysalis, good; if the chrysalis produces an imago, better still: and this expresses about all that the average naturalist boy looks or hopes for. This carelessness may be prevented by the use of charts containing headings for each stage of the insect's life, and blank spaces in which observed facts may be entered. Thus:

Egg.

Date of being laid	Position	Shape	Colour	Arrangement	Date of hatching

Caterpillar, Stage I.

Date of hatching	Colour	Length	Hairy or smooth	Resting position	Food	Time of feeding	Region of leaf eaten	Further remarks

and similarly, *mutatis mutandis*, with the successive stages. The charts should subsequently be used as the basis of a consecutive and comparative account of some of the insects reared.

The following books will be found useful: "An Introduction to Nature Study," Stenhouse (Macmillan); "The Natural History of Aquatic Insects," Miall (Macmillan); "Round the Year," Miall (Macmillan); "Practical Nature Study for Schools," Latter (Dent); "Eton Nature Study," parts i. and ii., Hill and Webb (Duckworth); "The Sea Shore," Furneaux (Longmans); "Introduction to Zoology," Davenport (Macmillan); "Natural History of some Common Animals," Latter (Cambridge Press); "Elementary Biology," Jeffrey Parker (Macmillan). Of these the three last are suitable only for senior candidates and for use by teachers.

IMITATION OR PHONETICS IN MODERN LANGUAGE TEACHING.

By F. M. VIPAN,
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A PARENT reading in the school prospectus that "boys are taught Modern Languages by the Direct Method" cannot but feel pleasure at the idea that his sons are receiving instruction on what he may conjecture to be a more profitable system than the one he was familiar with in his youth. It is only when he takes up the examination papers that his children sooner or later will have to answer, and sees the familiar extracts to be rendered in English and the foreign language, that a feeling of mystery pervades him as to why such an apparently radical change in method was necessary to produce no radical change in result.

Again, should he happen to change his place of residence, and send his sons to another school, a set-back in their progress in foreign languages is almost certain, owing, it will be alleged, to insufficient grounding in the essentials. Curiosity or interest may then lead the parent to inquire what these essentials are, what teachers themselves understand by "Direct Method," and he will probably find the interpretation of the same depending on the value they, as individuals, attach—one to translation, another to conversation, a third to grammar, a fourth to phonetics.

The nearest approach we can get to the definition of Direct Method is that it includes all forms of teaching in which oral work in the foreign tongue predominates over written. If this definition is correct, Master John, of Basingstoke, learning Greek eight hundred years ago from an Athenian maiden of twenty, and Montaigne three hundred years later, studying Latin with a "Ger-

maine altogether ignorant of the French tongue," both enjoyed the advantages of the system: in fact, until quite recently, residence abroad or intercourse with the foreigner was deemed indispensable if more than a reading acquaintance with a language was required. Whether translation, conversation, or grammar be the basis employed, "Imitation Method" is the name with which this means of acquiring a language has now been dignified, and its supporters, although sometimes exposed to the risk of being called unscientific and consequently old-fashioned, are nevertheless in the majority. That this system had Fitch's approval may be gathered from a lecture on teaching delivered in 1880, where he advocates the formation of "parrot classes," and the practice of making children utter complete French sentences, of which merely a rough translation was given them.

The other branch of the Direct Method which relies mainly on oral instruction is Phonetics. To reform the "wretched system of studying language" thirty years ago, a preliminary training in this science was urgently recommended. The suggestion was not taken up, and to-day, after twenty years of professed ignorance of the phoneticians' existence and ten of controversy on their necessity, the teacher who would take advantage of the present Act of Indulgence and base the study of a language on the art of pronunciation is generally regarded, possibly humoured, as a well-meaning but mistaken fanatic.

Instead of treating the former as the complementary method of the latter, teachers often adopt one branch in preference to the other, owing to chance circumstances of early training, methods seen in actual practice, or those they have studied privately at home or abroad.

With pupils whose school training is drawing to a close, and with whom possession of a good vocabulary is of the utmost importance, the older method of imitation is undoubtedly the more suitable: it is, in fact, the one generally favoured by those who already possess a good knowledge of one or two languages and are desirous of entering upon the study of a third. With young children, on the other hand, it is different. As most languages have sounds peculiar to themselves which can only be learnt by long practice, begun when the vocal organs are still in a plastic condition, the best possible pronunciation must be considered the only important item in the first year's syllabus. This workable basis can best be acquired by Phonetics.

For consider, for a moment, an attempt being made to teach children pronunciation by means of the older method, that is to say, by continual corrections on the part of the master. No long experience is required to prove that even did masters possess the patience it would nevertheless be a physical impossibility, for the foreigner as for the English teacher, to carry out this method with phonographic regularity, except in schools where classes are small and the hours of teaching limited to eighteen instead of twenty-eight. A

source also of constant interruptions, and consequently of irritation on the part of the best disposed pupil, the method does not lend itself so readily as does that of the visible speech to the reproduction of such French sounds as are contained in *en*, *on*, *un*, *in*, which the untrained English ear would be inclined to consider nuances rather than as distinctly different sounds.

Again, the Imitation Method takes it for granted that the ear is infallible, a belief which finds a great number of its supporters among the foreign masters teaching languages in English schools who have not yet given their serious attention to the subject, and conclude that the very fact of their possessing the requisite power of imparting in their own countries literary and other knowledge to children who already possess the requisite pronunciation renders them capable of imparting this same pronunciation to the child of the foreigner.

In such educational but non-phonetic centres as Brussels and Lausanne, British children attending State schools often acquire remarkable volubility and the foreign intonation: as for their pronunciation, if the children do not betray their nationality with the first words they utter, the best they can hope for is to be mistaken for Germans, Danes, Swedes, possibly in rare cases for Russians. And this result is due not to failure in learning to pronounce such distinctly foreign sounds as *o*, *ou*, *u*, *r*, but to those harder difficulties due to the close resemblance that exists between the foreign and English sounds, which the untrained ear, relying solely on the Imitation Method, is incapable of perceiving.

With regard to the second method, school inspectors and other educational authorities have lately alleged that an exclusive use of a phonetic transcription in the early stages is prejudicial at a later period to the acquirement of the current orthography. This must not be taken to imply that these authorities attach undue importance to the written as opposed to the spoken language: a passive knowledge of the archaic forms, whether acquired by correspondence or otherwise, may be sufficient for most university examinations, but no one would nowadays maintain that to train boys for written tests is the aim of modern language teachers. What prompted the allegation was the belief that as first impressions are the strongest, it might take much valuable time to dissociate from the pupil's mind what it had already taken much valuable time to instil, namely, the phonetic shorthand.

A proof that first impressions are not easily, in some cases never, effaced, and that the study of phonetics must precede that of the literary language, is to be found in the following extract from a brochure recently submitted to the Belgian Government. Here it is stated that "In Germany faults in pronunciation, as *che verme la borde*, are very common, even in the case of those professors who are loud in their praises of, and recommend, the phonetic script. These gentlemen say, in explanation of such mispronunciation, 'We did

not learn French by means of phonetics, but by the old method.'"

Generally speaking, all school children on the Continent go through an elementary course of physiology at one time or another, and know the position and use of the heart, lungs, bronchial tubes, œsophagus, and larynx. The writer has no wish to suggest that teaching hours should be lengthened to include this subject, but that teachers of French and English might advantageously devote their first lessons to a description of the organs employed in breathing and voice-production. Casts of the throat and mouth, false palates, manometers, &c., will help to awaken the interest of the pupil; but in case these are not procurable, a coloured sectional drawing of the head could replace the casts, two scraps of paper the vocal chords, whilst a simple experiment with a cigarette will illustrate the action of the soft palate in the production of nasal sounds.

The first lesson having been spent on introductory remarks on anatomy, the training proper by means of Victor's wall chart will then begin.

Whereas Germany allots four months to this preliminary training in the sounds of a foreign language, English teachers working under adverse conditions might reasonably allot six. The third term, therefore, of the scholastic year would see the pupil beginning in the current orthography the recapitulation of what had already been taken in the script, copied as homework and practically learnt by heart. This temporary break with phonetics must be complete, and the method must now aim, not so much at extirpation of first impressions as at starvation by disuse.

Confusions, nevertheless, when the written language is attempted, will be inevitable. Substitution of the symbol for the letter is perhaps the most frequent error of this period, a manifestation, like phonetics itself, of that law not unknown in schools called *la loi de la moindre action*: again, if the words required have not been previously copied by the beginner, many mistakes will be due to the fact that, though seen, they did not leave the impression of their historic spelling on his brain, an impression which only writing can indelibly fix. In the study of French, orthographical mistakes, such as writing "hazard" for "hasard," or those due to the assimilation of sounds, are, comparatively speaking, trivial, as is that of the omission of particles in colloquial expressions: these faults will correct themselves in time by the use of the reader. A great difficulty will probably be experienced when the pupil is called on to choose one of several combinations of letters as *er*, *és*, *éé*, *ai*, *et*, *est*, represented in phonetics by the single symbol *e*. In this case, it would perhaps be well to let the above endings form the principal subject of several lessons, when they would be treated separately as verbal, substantival, and, lastly, as adjectival terminations.

For the success of the method, suitable books are essential. In one volume continuous pieces expressed in pure colloquial forms and printed in phonetic script; similar pieces with perhaps the

addition of paraphrases, easy definitions, and synonyms, in the current orthography, in another. The present system of burying the phonetic part somewhere between the grammar, vocabulary, and index at the end of the book, instead of placing it at the beginning, must be condemned. Boys gain the impression that pronunciation is only of secondary, instead of primary, importance. Parallel columns, current orthography one side and phonetic (generally literary phonetic, disregarding ellipses and syncope) the other, must be altogether avoided, that the pupil may not have the opportunity of evading his difficulty by at once turning to the more familiar signs. Pictures at the end of the book might be dispensed with, but for class-work there would be coloured prints representing preferably a single subject. At present the desire for economy in equipping our secondary schools has encouraged the production of pictures so crammed with detail, and consequently on so small a scale, that the attention of the back boys of a form, at any rate, cannot be riveted so quickly as one could wish on the subject requiring explanation.

In a final comparison of the two methods a sacrifice of vocabulary will have to be faced by the phonetician, but the improvement in pronunciation and the good command a boy should possess of a perhaps very limited number of words will more than compensate for this loss.

It is at all events certain that the master entrusted with the furtherance of a boy's studies would not fail to appreciate more highly his predecessor's efforts to lay the only sure and solid foundation of a language than he would appreciate the feverish energy that gathers together a confused and promiscuous store of linguistic facts for the purpose of making a specious show on the occasion of the written examination.

In conclusion, it were well to consider the age at which a child, under existing conditions, might profitably begin the study of a foreign language, which we will assume to be French. This depends more or less on the social position or means of his parents. If the latter are in a position to send a boy to a first-rate preparatory and then to a public school, where he will be placed with others who have enjoyed similar educational advantages, ten, or even eight, need not be considered too young. Twelve, on the other hand, must be considered the most suitable age for boys at secondary schools of the grammar or municipal type, where there is a continual influx of scholarship holders from elementary schools. At present elementary-school pupils have had, as a rule, no linguistic training : they are therefore classed by their other attainments with boys of like age with themselves who have probably been studying one language, sometimes two, unfortunately, for a year or more. Teaching on an old but not Direct method, where written work predominated over oral, where all explanations were given in a boy's native tongue, and where the French-English dictionary was allowed, rendered it possible for those "expected to catch up" to make con-

siderable progress, at all events in translations. But beginners, in any class above the lowest, place teachers of modern languages who use the Direct Method at a greater disadvantage perhaps than they do those of any other subject, since their presence necessitates the oral recapitulation of much that the older members must have heard to satiety. In the "Secret of Herbart," Dr. Hayward remarks that "Two things are fatal to interest, over-familiarity and total ignorance."

Masters who have adopted modern methods recognise the impossibility of building the superstructure of a language before the foundations have been laid, and can only regret that those who, owing to, say, two years' training, have some knowledge of the subject, should be sacrificed to those who are totally ignorant, a sacrifice that might be avoided would secondary schools of the municipal type make arrangements whereby boys up to the age of twelve could confine their attention to those subjects only which are undertaken by boys of a similar age in elementary schools. As Regulations have now been issued by the Board of Education for the pronunciation of Latin in secondary schools on a uniform system, the appearance of this document engenders the hope that the suggestions of inspectors, as to what they consider the foundation of language-study, as well as the age at which it might in varying circumstances be begun, will be collected, collated, and finally embodied in another official edict for modern language teachers.

EDUCATION BY PRESCRIPTION.

IN the latter part of last year the Committee of the Medical Profession, the British Medical Association, and the Board of Hygiene and Temperance laid before the Board of Education a memorandum which was practically an expansion of the petition presented to the Board in July, 1904, urging the need of instruction "in hygiene and temperance" in elementary schools.

The memorialists urge : (1) that instruction in hygiene and temperance be now specifically introduced into the curriculum of the Code, without further delay; and offer in an appendix (iv.) suggestions whereby this might easily be effected without incurring more than a slight disturbance of the present curriculum, to the details of which (as set forth in the current official volume) they hold that much objection may be taken on both scientific and moral grounds. (2) Since such instruction cannot be satisfactorily given except by specially qualified and trained teachers, and since provision for the training of such teachers can hardly be said to exist, it is also urged that facilities for special training in these subjects be afforded to teachers, by entitling local educational authorities to pay without surcharge for students sent to take the requisite course of study at certain approved centres. Pending the establishment of this systematic training of student teachers, a provisional syllabus is appended for the instruction in hygiene and temperance of teachers already

trained in other subjects. And, finally, (3) it is urged that these subjects be reported on by H.M. inspectors.

Appendices showing (a) the teaching as given in army schools, the colonies, and foreign countries; (b) a list of local educational authorities which have expressed their approval of such teaching, are included in the memorandum.

Few indeed would be inclined to question the importance or the necessity of the main object of the memorandum presented by the deputation headed by Sir Thomas Barlow to Mr. Birrell, as summarised under the three heads already mentioned. Attention has been already directed to their necessity in these pages on more than one occasion; and the "pressing need of the introduction of these subjects into the curriculum of all secondary schools and training colleges," which the memorialists trust will also be recognised by the Board of Education, has been urged as nothing less than a logical necessity.

As might have been expected from its origin, the memorandum is full of interesting and suggestive matter. The first part of appendix iv. (the teaching of observation and ratiocination by nature-study) is a short but luminous essay with applications embracing a range far beyond the two subjects of hygiene and temperance, to which it has a special reference; and it might well be adopted as the foundation of all educational methods in general. As regards its deductions, there are two statements, the general acceptance of which would alone outweigh the loss of most other so-called "education": "Until a child has learned to be clean and to love cleanliness, any further learning is comparatively unimportant"; and, again—after indicating why it is that a young child's eyesight is immature as well as delicate (the human eye not reaching its complete development before the age of seven or eight years)—"It follows, then, that" the teaching of "reading, writing, and sewing are inadmissible for children up to seven or eight years of age."

At the same time, it would be idle to pretend that these directions for a fresh departure in education are in no respect open to criticism. It is most important, in teaching the elements of a subject which is not only new but also additional to a list already crowded, that all unessential details and all needless minutiae should be avoided. The foundation must be laid broad and strong and well; but it would be worse than useless to attempt to cram the workman thus engaged with a few isolated facts as to the tensile strength of the girders to be used in the superstructure, or to confuse him by illustrating the molecular differences between cast-iron and steel. Histological demonstrations may now and again serve to add points of interest to physiological facts which need to be known; but care should always be taken to make it plain that the former are, in the circumstances, not essential to the knowledge of either teacher or student. Otherwise, the value of a few special and isolated examples is certain to be exaggerated in this connection, and their significance

will assuredly prove misleading—in the literal sense of that word. It is earnestly to be hoped, therefore, that, when H.M. inspectors come to report on the results of the instruction given to student teachers and to their pupils, an acquaintance with microscopic slides of lung, liver, kidney, bacteria, &c., for instance, will not be exacted as a necessary proof of useful knowledge.

Again, we are convinced that greater discretion should be shown in the didactic treatment of such thorny subjects as alcohol and tobacco. By all means let every child be duly impressed with the evils certain to be entailed on his own immature body by the consumption of these substances, and let him learn that neither is at any time necessary for even grown-up healthy folk leading healthy lives. But beware of trading on the boundless faith of the young child by teaching him as gospel facts anything which his own observation is hereafter certain to make him question and qualify—possibly with all the disastrous results which sometimes follow the shattering of an ideal. Nor is it just and fair to any of those concerned to train the child by axioms which, rigidly applied to most of his relatives and friends, would class them as either fools or worse, whatever their repute as honest, able, and God-fearing folk. Yet, throughout these pages, the phrase "the use of alcohol" is invariably used as though identical with "the abuse" of it; and the meaning of "temperance" is degraded so as to signify only total abstinence from "alcohol, tobacco, and strong tea." We not only believe that there is real danger lest such teaching should defeat its aim, but the experience of such extreme wresting of language in this particular, as shown by the results accruing from it in the United States, amply supports this warning. From an educational point of view, that training in intelligent self-control which ensures moderation is far more valuable than a dead level of prohibition—and eventually affords a far stronger safeguard against the dangers of excess.

On other grounds, we might urge that the English language is not so rich in synonyms as to condone any endorsement of the vulgar error by which the excellent term "temperance" is emasculated so as permanently to divorce it from "moderation." Possibly those responsible for drafting the memorandum believed that, by reason of its varied experiences, the Board of Education would be indulgent to—just as, by virtue of their assumed attainments, its members might be deemed incapable of being corrupted by—slipshod English. We might thus explain their expressed desire that teachers of hygiene should instruct their pupils to "keep their lips closed while eating," when what they doubtless intended was to impress on them the desirability of keeping the lips closed while food is being chewed. As it stands, the advice is indeed a counsel of something less than perfection. But it might be commended, as a "problem exercise" to the expert in physical culture—if he wished to secure notoriety as a fasting man.

THE NATIONAL UNION OF TEACHERS.

THE PRESIDENT'S ADDRESS.

By J. L. PATON, M.A.

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THREE is much that is excellent in the annual address of the president of the National Union of Teachers, Mr. A. R. Pickles, of Burnley. It is full of apt quotation and pithy sayings. It looks at the question of education from the broadest point of view, not as the mere purveying of instruction, nor as the best way of meeting the commercial and industrial competition of Germany, but as the great method of a new social revolution which is to achieve the betterment of the people by enabling the working classes of this country to work out their own salvation.

It is a pity that such an address should have opened with an onslaught on the Board of Education. The War Office has gone out of fashion; nowadays people with an itch for throwing brickbats make the Board of Education their cockshy. The Cockerton judgment still rankles. It is, therefore, as well to repeat that the Cockerton judgment was an act of honesty in administration. Even though it seemed to put back the clock for the time, it was not well to build our new educational system on a lie. That the adverse consequences of that judgment to the children in the schools affected were so unimportant is due to the much-maligned Board.

Again, it is hard to see whether Mr. Pickles blames the Board for moving too fast or moving too slowly. He appears to do both. He accuses it in one breath of thwarting and hindering the development of secondary schools, and in the next of rushing through with unseemly haste questions of policy which ought to have been calmly debated and carefully thought out. The resultant inference is that the Board has gone ahead as quickly as was consistent with safety. Mr. Pickles complains that it has been too much down on the pupil-teacher centres. Does he think that all is well in these centres as at present constituted? Are those who are responsible for them themselves satisfied? Is it possible in two years (and half time at that) to weld into a society that is at one with itself that heterogeneous assortment of entries with every variety and degree of previous preparation and attainment? Is one astonished, when one realises the conditions, to find that the atmosphere is the atmosphere of the text-book, and the teachers who have higher ideals of culture and corporate life are utterly disheartened at the hopelessness of carrying them out? Another curious misconception occurs in this connection. "There are," says Mr. Pickles, "few other pupils (*i.e.*, in the secondary schools) with whom the pupil teachers can be taught. Put the 20,000 pupil teachers along with the 2,742 general pupils over sixteen, and you have the lion lying down inside the lamb." Mr. Pickles here assumes that the only pupils over sixteen years of age are those above the four years' course. This is, of course, utterly wrong. In my own

school, for instance, there are 64 above the course and 133 over sixteen years of age. If this proportion holds good for all—I have no means of telling whether it does—then the number of pupils over sixteen would be 5,698 instead of 2,742. And this alters the whole complexion of the case.

Mr. Pickles is anxious for the development of secondary education, but he is more anxious for quantity than quality. The Board is the reverse. Secondary education has had faults enough, but it has preserved a certain distinctive quality, impalpable, it is true, but all the more deserving to be cherished; there has been a unity of life, if not of external organisation; that unity has consisted in a tradition and ideal which is almost peculiar to English secondary schools, and we cannot afford to lose it. It may be interesting to illustrate what I mean from the boy's own point of view. When I read Mr. Pickles' address, I had staying with me two boys who had passed out of elementary schools into a secondary day school (not my own). I led the conversation quietly to this question of differentia between the two types of school, and asked them whether they felt the difference, and in what it lay. The answer was prompt enough: "No public spirit in the elementary school; not so much freedom; you didn't know your masters in the same way." I questioned them about the teaching. They said that geography and history were much better taught in the elementary school, but in the secondary school you learned to teach yourself; "homework was stiff, but it did make you grapple with things."

There is not much really to be added to this; it contains in germ everything, and its significance is great. I do not blame my primary-school colleagues, I do not praise my secondary-school colleagues. There is nothing to be gained by either kettle or pot through calling each other names. We are all of one brotherhood in the profession; we have much to learn from each other. The real root of the matter was finely expressed by Mr. Kitchener in his evidence before the Commission of 1895 (*vol. vi., p. 214*): "The Arnold of board secondary schools is yet to come; there is no more important, no more pressing, no nobler work to be done by a rising Arnold to-day than to show by striking example how the public-school feeling can be combined with higher grade elementary work." There are many women and men, not only in primary schools, but also in industrial schools and lads' clubs, who are working in the spirit of Arnold, but there has not been, as yet, any general diffusion of that spirit, and we should look to the newer generation of pupil teachers who are now passing through the secondary schools to do this work of diffusion. True efficiency cannot be gained without this "impalpable" factor.

It has nothing to do with social status or wealth. We are all at one with Mr. Pickles in repudiating the snobbish conception of secondary education as the privilege of the respectable. We say "Hear, hear" to the words in which he stig-

matises the sentence in which this conception emerges in a Board of Education report. Education is no longer for those who can pay for it; it should be for all who have the capacity to profit by it. If it is the duty of every citizen to do his best for the community, it is the duty of the community to place each individual in such a position and give him such equipment as will enable him to do his best. The standard by which we are to test our educational policy is, after all, the standard of the Golden Rule: "Are we ready to allow to others what we conceive to be necessary and desirable for ourselves? Have we one standard for ourselves and another for our neighbours? What is life for me is life also for my neighbour; the best life for me is the best life for him, and life is the full and free development of all the best powers and faculties of body, mind, and soul."

THE GEOGRAPHY OF THE BRITISH ISLES.¹

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II.

RIVERS AND COMMUNICATIONS.

THE relations of routes of communication to rivers and watersheds cannot be expressed in a simple formula. Where river-basins are bounded by high and well-marked watersheds, the roads and railways are naturally taken along the course of the river, and cross or tunnel under the watersheds at the points where these are most deeply notched. But where the valleys are broad and watersheds indistinct, we may often find a belt of lowland, due to the existence of softer rock, which though running across several river-systems affords a natural route of communication. Such a belt is Strathmore, lying between the Sidlaws and the Highlands, partly occupied by the Tay and its tributary the Isla, partly by the Esk, and giving the Caledonian Railway its route from Perth to Forfar. A similar belt lies in the Weald at the foot of the North Downs, and affords the South-Eastern Railway an almost straight and level route from Guildford to Dover, although it crosses the watersheds between the Wey, Mole, Medway, and Stour in turn.

South-East England.—The enormously preponderating importance of London over all other towns causes the main roads and railways to be arranged in a radiating manner with London as the centre. The first important physical obstruction which all the railways encounter is the Chalk escarpment, and most of them avail themselves of the notches at the head of valleys, dry or otherwise, to pass it. This is done by the G.E.R. near Saffron Walden, the G.N.R. at Hitchin, the M.R. at the head of the Lea Valley north of Luton, the L.N.W.R. at Tring, the G.C.R. at Wendover and Prince's Risborough. The original G.W.R. follows the easiest of all outlets—the

Thames Valley; but the more direct westerly route from Reading, after following the Kennet Valley, and the L.S.W.R. beyond Basingstoke, have to make their way across the broad Chalk area of Salisbury Plain, and to do this avail themselves of structural valleys (Vale of Pewsey and Vale of Wardour respectively), due to small anticlines in the middle of the Chalk area. The southern lines cross the Chalk escarpment by river-valleys at Guildford, Dorking, and Sevenoaks, and by tunnelling under a dry-valley-notch at Merstham.

Beyond the Chalk the course of the main railways is much more varied. The G.N.R., M.R., and L.N.W.R. get through the Oolite uplands of Northamptonshire by deep cuttings and tunnels. The G.W.R. at Swindon finds an easy pass over the watershed into the Avon Valley, which indents the Oolite escarpment in an unusual way, and it is only the windings of this valley that make the Box tunnel necessary.

The southern railways, after crossing the Weald, cross the South Downs partly by river-valleys (Arun, Ouse, &c.), partly by tunnelling under dry-valley-notches, as in the case of the line to Brighton.

In the *Northern and Western* region of England the broad plains offer easy routes of communication, while the uplands are serious obstructions, only traversable by means of steep gradients and tunnels, except in a few cases where very deep valleys have been cut in them. The long belt of lowland at the foot of the Oolite escarpment is the site of an almost continuous line of railways, diverted here and there into higher ground by the attraction of some great centre of population. From Exeter to Bristol this is part of the main G.W.R., considerable stretches of it being dead level. From Bristol to Derby and Nottingham, the line is part of the Midland, and is diverted from the lowland up the steep Lickey incline to Birmingham. In the lower part of the Trent Valley, and its continuation the Ouse Valley or Vale of York, we find the Great Northern and its continuation to Scotland, the N.E.R., which beyond the Tees becomes squeezed nearer and nearer to the sea by the encroachment of the Pennine uplands.

The branch lowland which runs from this one across the Midlands to Cheshire and Lancashire affords the route for the L.N.W.R. from Rugby (where it emerges from the Oolite hills) to Crewe, Chester, Liverpool, and Lancaster. From this last point it has to climb over the neck of high ground (Shap Fells) connecting Lakeland to the Pennines, in order to reach the lowland of the Vale of Eden and Carlisle.

The Pennine uplands, separating as they do the populous districts of Lancashire from those of the West Riding and Tees and Tyne, have offered a problem for attack by a number of railway engineers. The deepest notch across it is at the head of the Tyne, and across this runs the Roman Wall and the Newcastle and Carlisle Railway. Next in importance is the pass where the upper courses of the Ribble and Aire come near

¹ The first article appeared in THE SCHOOL WORLD for April, 1907.

together, which is taken advantage of by the Midland route from Leeds to the Lake District and Carlisle. But these lead to relatively thinly-populated districts on the western side; and it is farther south that the most numerous cross-connections, each with its long tunnel under the watershed, unite Manchester and the other cotton-towns to Leeds and Bradford and Sheffield.

The Welsh uplands being thinly populated, except in the coalfields, do not require many railways. The three most important lines run along the northern, southern, and eastern margins—L.N.W.R., Chester to Holyhead, and G.W.R., Gloucester to Fishguard and Milford—both leading to Ireland, and the latter taking the great coalports of Newport and Cardiff, and the tin and copper town of Swansea on the way—and a joint line from Bristol (*via* the Severn Tunnel) through Hereford and Shrewsbury to the north. Minor lines penetrate into the heart of Wales along the Dee, Severn, and Wye valleys.

Scotland.—The Southern Uplands form a serious barrier to communication between England and the Lowlands. The North British Railway (continuing the North-Eastern) finds a narrow path along the east coast to Edinburgh. Another branch continues the Midland from Carlisle to Edinburgh by a very up-and-down route, utilising the valleys of the Liddel, Teviot, and Gala. The Caledonian (continuing the L.N.W.R.) climbs over the watershed between Annandale and Clydesdale by a steep incline at Beattock, near Moffat; the Glasgow and South-Western (continuing the Midland to Glasgow) runs up Nithsdale and over to Ayr. Lastly, a joint line winds along the southern margin of the uplands of Galloway, from Carlisle to Stranraer, whence is the shortest sea-passage to Ireland (Larne).

On entering the Lowlands these few lines branch out into one of those complex networks so characteristic of industrial districts. But the Lowlands are not without their obstructions to railway communication. These are of two kinds: First, the broad Firths of Forth and Tay cut far into the land; but both are now bridged, greatly to the shortening of the route from Edinburgh to Dundee. Secondly, the high Ochils and Sidlaws in the northern Lowlands pinch in the various lines to two foci at Stirling and Perth—towns which are now great railway junctions for the same geographical reasons that once made them important strategic fortresses.

In the Highlands, railways are scanty. From Aberdeen the various lines of the Great North of Scotland radiate out along the lowland border and up some of the Highland valleys; but elsewhere we find long and extremely winding lines climbing with difficulty the Highland passes. The long inlets of the west coast make a line along that coast impossible, except for very short distances, and steamers carry all the traffic along it. Only at three points do railways reach the west coast—Oban, Mallaig, and Strome Ferry—the three lines starting from widely different points.

Ireland.—The absence of any great mass of con-

tinuous upland has facilitated the making not only of railways but also of canals, all the important rivers being linked up by the latter. The principal railways radiate from Dublin to Wexford, Cork, Galway, Londonderry, and Belfast. The largest upland area, that of Wicklow, coming right against the sea, compels the first of these lines to squeeze its way along the coast.

LOCALISATION OF INDUSTRIES.

Two main factors operate to determine the locality chosen by any industry—the supply of *raw material* and the supply of *power* (which in this country, at the present time, practically means *coal*). A third factor is sometimes of importance—accessibility to a market—but this tends rather to scatter than to localise, since markets are scattered; the industries most influenced by it are those which are least dependent on special raw materials or power on a large scale. Climatic conditions form a fourth factor, important in some industries, such as cotton-spinning, but usually of little significance.

It is only on the broadest survey of the distribution of industry that we can apply these simple factors as an explanation. When we turn to details, we find that, in the case of Britain, historical considerations cannot be neglected. Industries often maintain their existence in a locality after changed conditions have nullified the advantages to which their original settlement there was due. This tendency to local persistence has been aptly termed *industrial inertia*, and when a revolution in industrial processes takes place there is a conflict between industrial inertia and the new factors brought into existence by the change. Examples of the success of inertia are given by the straw-plait industry of Luton, originally localised there by the superior quality of the Chiltern straw, but now importing straw largely from abroad. Another example is found in the tin-plate and copper industries of South Wales, originally based on the proximity of Cornish ores, but now on the imports of ore from more distant sources. The failure of industrial inertia in face of a great industrial revolution is seen in the dying out of the iron industry in regions devoid of coal, particularly Sussex, when the use of coal in smelting replaced that of wood.

Lastly, it must be remembered that modern improvements in transport are tending to equalise the advantages of sites, and so to delocalise industries to some extent. The possibility of "garden cities" depends essentially on the fact that for many industries all places possessing good railway facilities are equally suitable. In spite of industrial inertia we may expect that in the future industry will gradually become less and less dependent on local conditions other than those of transport.

With these principles in mind we may quickly run over our great industrial districts.

South and East of England.—Owing to the absence of coal, industries are not localised here on the grand scale seen in the coalfields. London

is the home of an immense number of miscellaneous industries, dependent in large measure on imported raw materials, for the landing of which the Thames estuary affords excellent facilities.

The beech-woods of the Chilterns explain the chair-making industry of High Wycombe; the straw-plaiting of Luton has already been referred to; and the rich cattle-pastures of Northamptonshire produced originally the raw materials for the boot industry. Their positions as market centres in agricultural districts explain why agricultural machine-making is localised at Lincoln, Norwich, &c. In the Cotswolds, the cloth-industry of Stroud, originally dependent on the local sheep, has managed to persist when in so many other districts it has disappeared, owing to the proximity of the Bristol coalfield. The railway carriage and engine works of Swindon, Wolverton, Peterborough, and Brighton afford an example of an industry that from the first has been but little dependent on local conditions: Wolverton, for instance, was chosen for no other reason than that it was just half-way along the original London and Birmingham Railway. On the other hand, the shipping and fishery industries must always be localised on the coast. The large number of important ports in this part of Britain is the consequence of its facing the Continent.

The absence of native building-stone around London has led to a great demand for bricks, and in each of the clay-belts, which alternate with the escarpments, brickfields for the supply of London as well as their own neighbourhood have sprung up alongside the railways. By far the greatest aggregation of these is at Peterborough.

North-Western England.—Five main industrial districts may be recognised here, each dependent on a coalfield. The many minor districts cannot be touched upon within the limits of this article.

(1) *The Tyne and Tees District*—This is situated on the Durham coalfield, where it comes down to the sea. Two other English coalfields also come to the coast (South Wales and Cumberland), but these are situated away from the natural trend of oversea trade, and it is not surprising that it should be on the east coast that the ship-building industry has settled. The existence of lead-mines in the Pennine moors at the headwaters of the Tyne and Wear explains the metal industries of the coast; while the valuable iron-ore of Cleveland has created the town of Middlesbrough.

(2) *The West Riding.*—The staple industry here is the woollen manufacture, originally dependent on the sheep of the Pennine moors, but now importing wool from Australia, the localisation persisting by industrial inertia, powerfully helped by the presence of coal.

(3) *South Lancashire, with North Cheshire.*—The great cotton industry thrives on the western side of the Pennines because of the dampness of the climate, which is necessary for cotton-spinning, and the ease with which American cotton can be brought to Liverpool. Established as a

cottage industry before the industrial revolution, it has maintained itself as a factory industry, thanks to the presence of coal. Passing from the moorland valleys to the plain, we find with a diminution in the rainfall a change in the industries. The Cheshire plain produces great quantities of salt, which is the basis of alkali- and soap-production, and these industries with the allied glass and general chemical productions are concentrated on the course of the Mersey.

(4) *The Black Country* is situated mainly on the South Staffordshire coalfield, though its chief town, Birmingham, is some way off the actual coalfield. Here we have an ancient iron industry established on the borders of the Forest of Arden, which supplied it with the means of smelting its ore, as did the Weald forest to Sussex. But having a coalfield at hand the industry expanded immensely here when that of Sussex died away. A feature which distinguishes this area from the other great industrial areas is its situation far inland at a comparatively high altitude, on the watershed between the Severn and Trent.

(5) *South Wales.*—The high value of Welsh steam-coal leads to an immense export trade, and the eastern ports do scarcely anything but ship coal, their imports being insignificant. Farther west there are great tin-plate and copper industries, to which allusion has already been made. Iron-smelting is carried on largely on the northern margin of the coalfield, at Merthyr, Tredegar, Ebbw Vale, &c., local ore being used originally, but now imported Spanish ore. The cost of transporting this from the coast to the hills has led to the removal of some of the furnaces to the coast.

TOWN-SITES.

The localisation of an industry may explain why there is a large population in a district; it may sometimes explain why a village has grown to be a town or a small town to be a large one; but it does not, as a rule, explain the exact site of towns. It is *trade*, as distinguished from *industry*, exchange in contrast to production, that is the great determinant of town-sites. Trade most naturally springs up where routes of communication come to a focus. Where main roads cross, or a main road fords or bridges a navigable river, there it is convenient for traders from different regions to meet together and maintain a market for their wares. And since routes of communication are largely determined by natural features, the relation of town-sites to geographical conditions is often very obvious. We may recognise several well-marked types of town.

We may denote by the general name "bridge-towns" such as have sprung up at the lowest point where a navigable river is bridged. London, Bristol, Chester, Gloucester, Glasgow, are cases in point. Such places become the natural landing-places of imported goods and the market of dwellers on both sides of the river.

Another well-marked type is a town situated at a gap in a line of upland. Roads from all directions in the lowlands converge here, to diverge

again on passing the gap into the next lowland; and here producers from both lowlands will meet to exchange their wares. Such towns may be called "gap-towns." Lincoln, Guildford, Stirling, are examples. Such towns are (or were) of considerable strategic importance for obvious reasons, and though they have often fallen into a second-rate rank as towns in modern times, they maintain their importance, at least, as railway-junctions. Sometimes the gap-town is situated, not in the gap itself, but in the lowland a little way off. Thus Aylesbury, on a low hill rising out of the plain, and not far from three gaps in the Chilterns, has always been of more importance, both as a market town and a strategic point, than the villages in the gaps themselves, since it commanded all three routes. When in place of a gap we have a high-level pass, there is usually no town on the pass itself, but one at each end of the route over the pass, where it reaches the lowlands. Thus Carlisle and Newcastle may be regarded as, in a sense, gap-towns, since they stand at either end of the easiest route across the Pennines; but each stands in relation to another route—Carlisle at the opening of the Eden Valley, while Newcastle is also a bridge-town. These two towns, once the fortresses guarding the two routes by which England might be invaded by the Scots, are now, for the same geographical reasons, important junctions on the railway routes between the two kingdoms.

It is for the realisation of the importance of these town-sites that orographical maps are of the greatest value; and I will conclude by urging their importance upon all teachers of geography. Mere statements of the reasons for the importance of certain places, or the routes of railways, to which I have necessarily had to confine myself, are of small value. What is essential is that every scholar should, as far as possible, work them out for himself upon the map.

PARAPHRASING IN PRACTICE.

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III.

IN the English composition paper set in last year's senior Oxford Local examination, the first question, which as a matter of fact was obligatory, ran as follows:

"Paraphrase the following sonnet, paying special attention to the italicised words. Add notes interpreting the historical allusions :

" While poring Antiquarians search the ground
Upturned with *curious* pains, the Bard, *a Seer*,
Takes fires:—The men that have been re-appear;
Romans for travel *girt*, for business *gowned*;
And some recline on couches, myrtle-crowned,
In festal glee: why not? For fresh and clear,
As if its hues were of the passing year,
Dawns this time-buried pavement. From that mound

Hoards may come forth of Trojans, Maximins,
Shrunk into coins with all their warlike toil:
Or a fierce impress issues with its foil
Of tenderness—the wolf, whose *suckling Twins*
The unlettered ploughboy pities when he wins
The *casual treasures* from the furrowed soil."
(Wordsworth.)

We gave the examiners' report on the candidates' rendering of this sonnet in our first article. It "proved too hard" for the unlettered schoolboy. In truth, it was not likely to prove easy to anyone who had not been through such a course of literature as we have already suggested. We ourselves know modern-side boys of more than average ability who took the examination and confessed that the passage was quite beyond them. But Macaulay's "Lays" and Milton's "Lycidas" between them would have flooded the thing with light. Gray's "Bard" or "Elegy" would have accounted for anything not covered by them. In fact, had we set out purposely—as we did not set out—to devise a scheme to lead up naturally to the senior stage of paraphrasing, we could not have chosen a better example for our end than this set by the Locals examiners. No model could better test that *association* of meaning and colour which Mr. Bowen maintained must be appreciated in a successful paraphrase.

The higher phases of the art have been more than touched upon by Mr. Fowler in the article to which we have several times referred, and he has in it mentioned outstanding models of scholarly paraphrasing; we shall, therefore, content ourselves with sketching suitable exercises and giving some passages for paraphrase. But before doing so, we should like first to suggest that Bacon's "Essays" in prose and any good sonnet in verse present almost inexhaustible material, and then to refer, by way of general warning (and not necessarily literal adhesion), to Prof. Saintsbury's opinion that "analysis of Shelley's poetry is nearly impossible, and of little value when it can be made."

(1) Substitute *loose* for *periodic* structure in the following passage.

(2) Rewrite in modern English (e.g., pieces from "Defence of Poesy," "Euphues," &c.).

(3) Restate the following argument in your own words.

(4) Rewrite, substituting for oratorical tone the tone of narration or description.

(5) Restate in *oratio obliqua* the following speech.

The three pieces which follow were set—not at sight—in recent Cambridge Local examinations.

(a) A witchcraft drew me hither;
That most ingrateful boy there by your side,
From the rude sea's enrag'd and foamy mouth
Did I redeem; a wreck past hope he was:
His life I gave him, and did thereto add
My love, without retention or restraint,
All his in dedication; for his sake
Did I expose myself, pure for his love,
Into the danger of this adverse town;
Drew to defend him when he was beset:

Where being apprehended, his false cunning—
Not meaning to partake with me in danger—
Taught him to face me out of his acquaintance,
And grew a twenty-years-removéd thing
While one would wink.

(Shakespeare, *Twelfth Night.*)

- (b) Can such things be,
And overcome us like a summer's cloud,
Without our special wonder? You make me strange
Even to the disposition that I owe,
When now I think you can behold such sights,
And keep the natural ruby of your cheeks.

(Shakespeare, *Macbeth.*)

- (c) How he solicits heaven,
Himself best knows: but strangely-visited people,
All swoln and ulcerous, pitiful to the eye,
The mere despair of surgery, he cures;
Hanging a golden stamp about their necks,
Put on with holy prayers: and 'tis spoken,
To the succeeding royalty he leaves
The healing benediction.

(Shakespeare, *Macbeth.*)

We proceed now to give selections which we think specially educative for our present purpose.

(1) Express in your own words the thoughts contained in the following passage:

Perhaps in this neglected spot is laid
Some heart once pregnant with celestial fire;
Hands, that the rod of empire might have sway'd,
Or waked to ecstasy the living lyre:

But knowledge to their eyes her ample page,
Rich with the spoils of time, did ne'er unroll;
Chill penury repress'd their noble rage,
And froze the genial current of the soul.

(2) Put clearly into prose the thoughts conveyed in :

- (a) The One remains, the many change and pass;
Heaven's light forever shines, earth's shadows fly;
Life, like a dome of many-coloured glass,
Stains the white radiance of eternity,
Until Death tramples it to fragments.—Die,
If thou wouldest be with that which thou dost seek!
Follow where all is fled! Rome's azure sky,
Flowers, ruins, statues, music—words are weak
The glory they transfuse with fitting truth to speak.
- (b) O gentle child, beautiful as thou wert,
Why didst thou leave the trodden paths of men,
Too soon, and with weak hands though mighty heart
Dare the unpastured dragon in his den?
Defenceless as thou wert, oh! where was then
Wisdom the mirrored shield, or scorn the spear?
Or, hadst thou waited the full cycle when
Thy spirit should have filled its crescent sphere,
The monsters of life's waste had fled from thee like deer.

* * * * *

The herded wolves bold only to pursue,
The obscene ravens clamorous o'er the dead,
The vultures to the conqueror's banner true,
Who feed where desolation first has fed,
And whose wings rain contagion—how they fled,
When, like Apollo from his golden bow,
The Pythian of the age one arrow sped,
And smiled!—The spoilers tempt no second blow,
They fawn on the proud feet that spurn them lying low.

(3) Expand the following sonnet, explaining all the allusions :

Fairfax, whose name in arms through Europe rings,
Filling each mouth with envy or with praise,
And all her jealous monarchs with amaze,
And rumours loud that daunt remotest kings;
Thy firm unshaken virtue ever brings
Victory home, though new rebellions raise
Their Hydra heads, and the false North displays
Her broken league to imp their serpent wings.
O yet a nobler task awaits thy hand
(For what can war but endless war still breed?)
Till truth and right from violence be freed,
And public faith cleared from the shameful brand
Of public fraud. In vain doth Valour bleed,
While Avarice and Rapine share the land.

[Note.—Almost any other of Milton's sonnets would be an equally good subject for paraphrase.]

(4) Rewrite in your own words "Lycidas," II. 50-75.

Where were ye Nymphs, when the remorseless deep
* * * * * Comes the blind Fury with the abhorred shears
And slits the thin-spun life.

(5) Paraphrase the two following sonnets of Shakespeare :

- (a) When to the sessions of sweet silent thought
I summon up remembrance of things past,
I sigh the lack of many a thing I sought,
And with old woes new wail my dear time's waste;

Then can I drown an eye, unused to flow,
For precious friends hid in death's dateless night,
And weep afresh love's long-since-cancell'd woe,
And moan the expense of many a vanish'd sight.

Then can I grieve at grievances foregone,
And heavily from woe to woe tell o'er
The sad account of fore-bemoanéd moan,
Which I new pay as if not paid before:

—But if the while I think on thee, dear Friend,
All losses are restored, and sorrows end.

- (b) To me, fair Friend, you never can be old,
For as you were when first your eye I eyed
Such seems your beauty still. Three winters cold
Have from the forests shook three summers' pride;
Three beauteous springs to yellow autumn turn'd
In process of the seasons have I seen,
Three April perfumes in three hot Junes burn'd,
Since first I saw you fresh, which yet are green.

Ah! yet doth beauty, like a dial-hand,
Steal from his figure, and no pace perceived;
So your sweet hue, which methinks still doth stand,
Hath motion, and mine eye may be deceived:

For fear of which, hear this, thou age unbred,—
Ere you were born, was beauty's summer dead.

(6) Paraphrase the following sonnet of Wordsworth :

The World is too much with us, late and soon,
Getting and spending, we lay waste our powers;
Little we see in Nature that is ours;
We have given our hearts away, a sordid boon!

This Sea that bares her bosom to the moon,
The winds that will be howling at all hours
And are up-gather'd now like sleeping flowers,
For this, for everything, we are out of tune;

It moves us not.—Great God! I'd rather be
A Pagan suckled in a creed outworn,—
So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sight of Proteus rising from the sea;
Or hear old Triton blow his wreathed horn.

We will now give two or three prose passages for paraphrasing.

(1) Riches are for spending; and spending for honour and good actions. Therefore extraordinary expense must be limited by the worth of the occasion; for voluntary undoing may be as well for a man's country as for the kingdom of heaven. But ordinary expense ought to be limited by a man's estate, and governed with such regard, as it be within his compass; and not subject to deceit and abuse of servants; and ordered to the best show, that the bills may be less than the estimation abroad. Certainly, if a man will keep but of even hand, his ordinary expenses ought to be but to the half of his receipts; and if he think to wax rich, but to the third part. It is no baseness for the greatest to descend and look into their own estate. Some forbear it, not upon negligence alone, but doubting to bring themselves into melancholy, in respect they shall find it broken: but wounds cannot be cured without searching.—Bacon, *Of Expense*.

(2) Why the Author of Nature does not give His creatures promiscuously such and such perceptions, without regard to their behaviour, why He does not make them happy without the instrumentality of their own actions, and prevent their bringing any sufferings upon themselves, is another matter. Perhaps there may be some impossibilities in the nature of things which we are unacquainted with. Or less happiness, it may be, would upon the whole be produced by such a method of conduct than is by the present. Or perhaps divine goodness, with which, if I mistake not, we make very free in our speculations, may not be a bare single proposition to produce happiness, but a disposition to make the good, the faithful, the honest man happy. Perhaps an infinitely perfect mind may be pleased with seeing his creatures behave suitably to the nature which he has given them, to the relations which he has placed them in to each other, and to that which they stand in to himself which, during their existence, is even necessary, and which is the most important one of all.—Butler's *Analogy*.

(3) 'Tis next alleged we must not expose ourselves to temptations without necessity, and next to that, not employ our time in vain things. To both these objections one answer will serve, out of the grounds already laid, that to all men such books are not temptations nor vanities, but useful drugs and materials wherewith to temper and compose effective and strong medicines, which man's life cannot want. The rest, as children and childish men, who have not the art to qualify and prepare these working minerals, may well be exhorted to forbear, but hindered forcibly they cannot be by all the licensing that sainted Inquisition could ever yet contrive, which is what I promised to deliver next: that this order of licensing conduces nothing to the end for which it was framed, and hath almost prevented me by being clear already while thus much hath been explaining. See the ingenuity of Truth, who, when she gets a free and willing hand, opens

herself faster than the pace of method and discourse can overtake her. It was the task which I began with, to show that no nation, or well-instituted state, if they valued books at all, did ever use this way of licensing; and it might be answered that this is a piece of prudence lately discovered; to which I return that, as it was a thing slight and obvious to think on, so if it had been difficult to find out there wanted not among them long since who suggested such a course, which they not following, leave us a pattern of their judgment, that it was not the not knowing, but the not approving, which was the cause of their not using it.—Milton, *Areopagitica*.

CAMBRIDGE LOCAL EXAMINATIONS, 1906.

HINTS FOR TEACHERS FROM THE EXAMINERS' REPORTS.

ONE useful purpose at least is served by a well-conducted external examination, for it serves to lay bare general weaknesses in the knowledge of candidates, and to indicate subjects to which teachers may with advantage devote particular attention in their teaching. The following remarks from the forty-ninth annual report of the University of Cambridge Local Examinations Syndicate will show what subjects appear to present difficulties to a majority of candidates, and where additional work and recapitulation are desirable. The order in which the subjects are dealt with follows that of the original report.

COMPULSORY SECTION.—The examiners of the preliminary candidates in *arithmetic* state that a very large number both of boys and girls have no clear idea of the meaning of "rate per cent." in interest or profit. Though a fair number gave the correct answer to the easy problem, it was often difficult to find out, from their way of doing the question, whether they understood what they were about or obtained the right answer by accident.

The most serious fault in the case of junior candidates was inaccuracy in simple addition, multiplication, and division. At some centres the working of the questions was confined to a margin of paper about an inch wide; such cramped work conducted neither to clearness nor to accuracy. In the second half of the paper ignorance of tables, especially of cubic measure, was very common.

At some centres the work of senior candidates was very slovenly and inaccurate. Many candidates failed to obtain the final answer to a question in decimals to the required degree of accuracy because they used too rough an approximation in the first part of their answers. In the answers on compound interest the calculation was not infrequently carried to an absurd number of places of decimals.

ENGLISH SUBJECTS.—There was a want of clear distinction in the *English grammar* answers of junior candidates between gerund, verbal noun, and present participle, and between adverb and conjunction. The question on adverbial clauses was only fairly well done.

Speaking of the *English composition* papers of preliminary candidates, the examiners say that candidates should be warned against stringing sentences together with "and . . . and," and against the ambiguous use of pronouns. It may again be pointed out that more attention should be given to punctuation. There was also an appearance of slovenliness in the neglect of interrogation-marks and inverted commas.

So far as the essays of junior candidates were concerned, it is reported that in the boys' papers these were often jejune, badly arranged and expressed, and not free from grammatical errors, while many of those written by the girls consisted of a string of monotonous, unconnected sentences, separated only by commas. The better candidates were often partially, but seldom completely, successful in expressing in a single complex sentence the sense of a number of simple sentences. The correction of faulty sentences was much the weakest part of the papers.

The *paraphrasing* of Scott's "Lady of the Lake" by preliminary candidates was rarely correct or concise, and that of Shakespeare's "Henry V." by junior candidates was disappointing.

In the answers of junior candidates to the questions on "Henry V." some lack of intelligence was shown in estimating what information was required for the comparison of two characters in the play. With some bright exceptions, the candidates, in answering these questions, merely wrote out selections from the introductions to their text-books, often with such mistakes as showed that they had not understood them. The paper for senior candidates had been framed, for the most part, as a test of a general appreciation of "Henry V." as a *play*, but, while a very fair number of the candidates had acquired an intelligent conception of the dramatic presentation of the theme and of the conditions of the Elizabethan stage, the majority showed only too clearly that they had read the play with little reference to its dramatic significance.

Referring to the answers of senior candidates to the questions on English authors, the examiners state that in paraphrasing, the tendency of all the candidates was to give a general indication of the meaning rather than an accurate rendering of the language and construction; the great majority altogether failed to grasp the meaning of the stanza from "Childe Harold"; the paraphrasing of passages from "The Tempest" was better done. The questions generally attempted and best answered were those which demanded a knowledge of bare facts rather than evidence that the candidates really understood motives, causes, and aims.

Constitutional history was perhaps the weakest point in the answers of senior candidates to the *English history* paper. The constitutional significance of the Synod of Whitby was generally missed; very few candidates showed an accurate knowledge of Henry II.'s judicial reforms; there was much uncertainty as to the date and duration of the Reformation Parliament, which was sometimes taken to mean "Parliament during the Re-

formation"; Darnel's case was scarcely ever cited in connection with the Petition of Right; and the accounts of the growth of toleration under George III. and George IV. were generally poor. Elizabeth's treatment of Mary, Queen of Scots, was discussed fairly well by very many candidates, but the legal aspect of the question was generally neglected.

The answers in *geography* of senior candidates showed that the physical aspect of geography had again been somewhat neglected. This was shown by the answers to the questions on the lakes of Asia and the monsoons. Rivers were frequently described as running from the sea to the mountains, and throwing off tributaries, while much confusion was caused by neglect of the rule that a wind is named after the point of the compass from which it blows. Map-drawing showed some improvement, but still left much to be desired.

CLASSICAL SECTION.—The set book had evidently been got up with interest by preliminary candidates offering *Latin*, but the translations constantly betrayed ignorance of the analysis of the sentences. A few candidates made sense of the unprepared piece, or of parts of it; but most of the attempts sent up were mere guess-work. The composition was extremely weak.

Many junior candidates were safe in simple sentences only; the easy complex sentences were very often badly rendered. In the great majority of cases, little or no training in composition had been given, and French and German words were used freely to eke out a deficient Latin vocabulary.

MODERN LANGUAGES SECTION.—The renderings of easy English sentences into *French* by preliminary candidates were, as a rule, poor and incorrect; very few of the candidates knew the French for "until." The replies in French to the questions set in that language were badly done, though the questions were for the most part understood. The spelling of French words throughout was very faulty, and the accents were usually either omitted or misused.

The *French accenture* of junior candidates was weak. It was clear that at many centres insufficient attention had been given to this branch of the subject. In the short sentences for translation into French, the work, speaking generally, was good, but idiomatic renderings were frequently marred by grammatical blunders.

The answers of senior candidates to the question on the use of the indicative and subjunctive moods showed that this part of the subject was very imperfectly known. The change of a sentence from direct to indirect speech puzzled a large number of candidates; many gave the translation into English, while a few stated they did not understand what was meant by "indirect speech." The performance of these candidates in composition was not satisfactory, in spite of a few excellent renderings of the English passage set. The "free composition" was almost uniformly poor.

MATHEMATICAL SECTION.—In their *geometry* work much carelessness was shown by preliminary candidates, both in drawing lines and angles to

measure, and also in measuring lines and angles already drawn. Results, too, were often given in *inches* to questions that had been set in *centimetres*. A fair number of correct answers were sent up to the proposition set from the third book of Euclid; but few attempts were made to solve the corresponding rider. An easy rider, however, as to the relation between the side and the height of an equilateral triangle was successfully attempted by several of the candidates. The only question that was poorly answered by junior candidates was one which required a knowledge of the locus of a point at which a given line subtends a right angle. There was observable also, in some cases, an imperfect comprehension of the meaning of such terms as *isosceles*, *perpendicular*, *locus*. The various proofs offered by the candidates indicated that the use of modern text-books on geometry is becoming more common, and the general character of the work showed that under the new regulations fewer candidates find the subject so hopelessly difficult as when Euclid's treatment of it was rigorously exacted. On the other hand, judging from the way in which different kinds of proofs were written out, there would seem to be less risk of important details being omitted when the proofs attempted are those of Euclid than in the case of other proofs.

It was strange to observe how many preliminary candidates unnecessarily increased their labour in the *algebra* paper by finding the product of four algebraical factors before instead of after substituting the values of the letters. Great weakness was shown in dealing with a problem leading to a simple equation, comparatively few candidates showing a clear grasp of the data. Many who did well in other respects were unable to solve equations involving literal coefficients. The question on graphs was well answered by the majority of those who attempted it, although a considerable number failed to use the prescribed unit of length. This part of the subject appears to be neglected in many schools.

Questions on factorising, except in a very simple case, were badly done by junior candidates, and the attempts at finding a highest common factor were often failures. In the simplification of fractions there was much inaccuracy, and often ignorance in the management of signs. The equations were generally solved; but there were comparatively few good graphs, and in a problem it frequently happened that numbers with different units were added or subtracted.

In the solution of two simultaneous equations, one linear and one quadratic, a very common mistake of senior candidates was the squaring of the linear equation, resulting in four sets of values of the variables instead of only the two sets required. The graph was not well done; a number of candidates drew the graph set in the examination of the preceding year, which bore no resemblance to the one they were asked to draw.

NATURAL SCIENCES SECTION.—At some centres preliminary candidates taking *chemistry* used chemical formulæ which they did not understand

and which were quite unnecessary. Very few attempted a simple question on the experiments by which the properties of chalk and quick-lime can be illustrated.

The answers of junior candidates to questions on descriptive chemistry were better than those on theoretical points and showed that the teaching had been largely experimental, but they also showed that appeal had been made too generally to the memory rather than to the reasoning powers. Frequently experiments were described with fair accuracy, although it was obvious that they had not been understood. A large proportion of those who were rejected had so little knowledge of the subject that they could not be regarded as serious candidates.

Many senior candidates were unable to work out their results in their practical chemistry.

Many senior candidates offering *heat* appeared to have taken the paper without any serious preparation, and had neither seen nor done any experimental work in the subject. In *light*, the senior candidates showed little knowledge of the properties of mirrors and lenses.

Their answers to the questions on *statical electricity* showed that many senior candidates had never understood the meaning of the fundamental definitions; for instance, very few correct definitions of an electric field were given, and a large number of the candidates confused lines of electric force with equipotential surfaces. As in the preceding year, the answers to the questions on magnetism were, with a few exceptions, very weak.

The answers of preliminary candidates to the *botany* questions dealing with plant-functions were less satisfactory than those involving a description of form; nearly every one attempted the question, "Explain what happens if a green plant is deprived of (a) sunlight, (b) water," but in comparatively few cases was any explanation given. The answers of junior candidates requiring a knowledge of simple physiological experiments were, with a few exceptions, poor.

A simple specimen of barberry showing leaves reduced to spines was almost uniformly misunderstood by senior candidates, affording evidence that very few of the candidates had gained a knowledge of external morphology from the actual observation of specimens. Physiological morphology had clearly been neglected in the teaching, as only a small number of good answers were obtained to a question on the adaptation of the root-system to its work. The importance of this branch of the subject cannot be too strongly urged upon teachers, as by its means alone can morphology be made of any considerable educational value. A knowledge of simple experiments on geotropism and heliotropism was sadly wanting except in the case of candidates from a few centres. There can be no excuse for the neglect of experiments which can be carried out in any class-room at the cost of two or three shillings. In answering an easy question on seed-dispersal many candidates not only confused fruit and seed, but did not even distinguish between the mere

opening of a fruit and the actual dispersal of the seeds.

There was a general want of appreciation of the difference between a sketch and a map by junior candidates taking *physical geography*: a majority of the candidates copied the sketch supplied instead of constructing a map from it. Latitude and longitude were, with few exceptions, defined as lines instead of angles. The statements that the trade winds start from the poles and that all lava solidifies into pumice were common, as was also a tendency to regard a diagram as an answer to a question.

Some of the senior girls, indeed, attempted to describe a fog and to explain its formation without once mentioning either water or water-vapour. Almost all the candidates considered every change in a coast-line to be evidence of elevation or depression, and they failed to recognise the effects of deposition and erosion as in any way distinct. Except perhaps a dozen, all those who answered the question on tides seemed to be under the impression that the moon, on account of its nearness, attracts the earth more strongly than the sun does. Even those who wrote of "differential attraction" did not, in most cases, know what they meant by the expression.

THE CAMBRIDGE NATURAL HISTORY.¹

THE first volume of this now well-known series appears ninth in order of publication, leaving but one volume, the fourth, to complete the whole of the projected work. As is fitting, the opening chapter is devoted to a discussion of the properties of protoplasm, the nature of the animal cell, and the distinctive features of animals and plants. This is followed by one hundred and twenty pages devoted to the Protozoa proper. Here we notice a lack of uniformity among the co-authors. Prof. Hartog prefacing his sections with italicised definitions; the remaining authors, while giving a general preliminary account of groups and sub-groups, do not attempt the "cut-and-dried" concise statement. We should have been glad to see Prof. Hartog in line with his company in this respect, for his definitions, though accurate, are at times cumbersome, and his use of the word "organ" in a double sense in the definition of Protozoa is confusing. Apart from this one slight criticism we have nothing but praise for Prof. Hartog's work. He has produced a thoroughly readable and interesting account of these lowly but important animals, and has so skilfully dealt with the technicalities that we imagine that the layman in zoology could read his chapters with appreciation and enjoyment.

Prof. Hickson, in dealing with the Coelenterata, has adopted a probably safe course in separating the Scyphozoa (jelly-fishes) from the Hydrozoa on the one hand, and the Anthozoa on the other.

¹ "The Cambridge Natural History." Vol. i. Protozoa, Porifera, Coelenterata, Ctenophora and Echinodermata. By Profs. M. Hartog, I. B. J. Sollas, S. J. Hickson, and E. W. MacBride. (Macmillan.) 17s. net.

By different schools of zoologists these animals have been placed by some in the former, but by others in the latter class; and we agree with the author that an intermediate position as a distinct class is the best expression of our present state of knowledge. We must confess to a feeling of disappointment on reading Prof. Hickson's discussion of coral reefs. While we are fully prepared to admit that Darwin's theory of subsidence is a possible, nay, probable explanation of the origin of some reefs, a statement which makes no mention of Murray's rival theory of up-growth from considerable depths, but is content with adducing the phenomena of the Maldivian Archipelago and its plateau of denudation as the case for the other side, appears somewhat inadequate. Moreover, we do not find ourselves in agreement with the author as to the conclusion to be drawn from the Funafuti borings; our own verdict after reading the Royal Society's Report in 1904 was "not proven."

It is invidious to particularise where all is good, but we may perhaps be allowed to say that Prof. MacBride's account of the Echinodermata appeared to us the best portion of this valuable volume. He has incorporated so much physiology in his accounts that we feel we are dealing with the *living* animal in its own waters, and not merely the corpse submerged in the dissecting dish. The description of the functions of the pedicellariæ is quite fascinating.

The whole volume is profusely and beautifully illustrated, and throughout is up-to-date in a degree that reflects the utmost credit on all four authors.

THE EDUCATION (SCOTLAND) BILL.

FOR the third and, it is to be hoped, last time of asking, an Education (Scotland) Bill has been laid on the table of the House of Commons. This Bill has a much more restricted scope than its unfortunate predecessors. By avoiding some of the vital questions raised by them, it may possibly escape the strenuous opposition they met with, and arrive eventually in the desired haven of Acts.

The Bill has so far been received with but modified enthusiasm by the country at large. Yet it contains one or two provisions that mark a great advance on anything that has previously appeared before the legislature. Thus, for example, the Bill proposes to give school boards the power of enforcing the attendance at continuation classes of all pupils between fourteen and seventeen years of age who are not otherwise receiving a satisfactory education. These years, by general consent, are the most critical in a boy's life, and it would be a great gain if they were spent to some extent under adequate supervision and discipline. It should also be remembered that the question of industrial advancement is essentially an educational one. Hitherto the full fruits of our school system have been lost through education ceasing, for the large majority of the population,

at fourteen years of age, an age when real education should just be beginning. Any movement for continuing general education beyond that stage should have the hearty support of the public. From social, moral, and educational points of view, the new provision in this year's Education Bill is one of the most far-reaching that has come before Parliament for many years. In the Bill as drafted by the Secretary for Scotland it is left to the discretion of the school board to decide for or against compulsory attendance at continuation classes. Before the Bill assumes final form it is to be hoped that this discretionary power will be withdrawn, and that statutory authority will be given for compulsory attendance at continuation schools for all between fourteen and seventeen years of age.

The main provisions of the new Bill are given in the following summary :

EDUCATION (SCOTLAND) BILL.

Powers of School Boards.—(i) It shall be lawful for school boards jointly or singly to incur expenditure—

(a) In providing any form of instruction which may be sanctioned by Code or Minute of the Department.

(b) In providing for physical training and recreation of pupils.

(c) In providing accommodation, apparatus, equipment and service for supply of meals to pupils, provided no expense incurred in the purchase of food is charged against the school fund.

(d) In providing pupils with books, stationery, or other necessary school equipment.

(e) In paying salaries of superintendents and organisers of technical or other special forms of education.

(f) In establishing bursaries for attendance at secondary schools, central institutions, or universities.

(g) In providing educational facilities for pupils in outlying districts.

(h) In paying expenses of delegates to educational conferences.

(i) In providing for the medical inspection and supervision of schools and scholars.

(2) School boards shall have the power of enforcing the attendance at continuation classes of pupils between fourteen and seventeen years of age who have been granted exemption from school before fourteen years of age.

(3) School boards shall have the power to make compulsory the attendance at continuation classes until the age of seventeen of young persons who are not otherwise receiving a suitable education.

(4) School boards are empowered to grant pensions to all teachers in their employment.

(5) The Department will be prepared to pay to school boards a grant not exceeding one-half of the pension granted, the total amount of pension in no case to exceed two-thirds of the retiring salary.

(6) An Education (Scotland) Fund shall be constituted from certain grants at present accruing to Scotland, and this Fund shall be applied to the following purposes in the order stated :

(a) Making grants towards the payment of pensions of teachers.

(b) Meeting the expenses of the examination of secondary schools.

(c) Making payment to central institutions similar to those at present allowed by town and county councils.

(d) Dividing the balance among the Secondary Education Committees, having regard in so doing to the necessities of each district.

(7) School boards providing education for pupils outside their own area are empowered to recover the additional expenditure thus incurred from the school board to whose area the said pupils belong.

(8) At every election for a school board, each voter may give one, and no more than one, vote for each candidate.

(9) Provision is made for the transference of endowed schools to the school board where such transference is desired.

THE SCIENCE OF EDUCATION.¹

WHEN the history of education is examined its chaotic condition becomes manifest. From Aristotle to the men now living, we find the problem of education discussed from many points of view, with many different objects in mind, and under widely different social conditions.

The Greek idea of education and culture was based upon the existence of a privileged class, fed, clothed, and sheltered by the labour of slaves—a real aristocracy devoted to war, art, literature, and luxurious living. The sway of the so-called classic idea of education has been and still is one of the marvels of history. The splendour of Greek art, the brilliancy of Greek literature, and the keenness of Greek logic have held the world as in a trance, unable to break away from its charms—though it has been unsuited to other peoples and other social conditions.

I need not turn the pages of history to name the writers and teachers who have risen in protest or set forth new doctrines. In many cases the new prophet or teacher has had in mind a privileged individual, or a privileged class, the education of a prince, of a nobleman, of a statesman, a monk, a scholar, a gentleman—always an exceptional person or class. The common people, the toilers in the fields and mines, the rank and file of soldiers and sailors, the builders of houses and ships, the craftsmen at looms and benches—for all such there were no educational theories. Such people had no education, and they were supposed to need none beyond that gained in following the occupations or crafts themselves. The assumption was not only that there was no education suited to the common people, but that an interest and participation in the practical arts was degrading to the taste and deadening to the mind. To be sure, a Rabelais or a Rousseau saw abundant reason for rebelling against the scholasticism of the grammarians, and advocated a return to a study of the external world and the methods of controlling and utilising the forces of nature; but even they had no science of education, and they had small following.

THE RECOGNITION OF UTILITY AND SCIENCE.

Francis Bacon, more than any other man, showed the inadequacy of the classic method, fine as it was along certain lines, and the comparative worthlessness of scholasticism, and he opened the eyes of the educated people of his time to the wealth of opportunity for interesting and profitable study in the great laboratory of nature; and better than all else, he set forth the dignity and intellectual value of science study—and he vigorously scouted the idea that the usefulness of scientific truth to any degree detracted from its educational value.

But none of the writers touching on education, with the

¹ Abridged from an address delivered at New York by Prof. C. M. Woodward, of Harvard University, as president of the American Association for the Advancement of Science.

possible exception of Froebel and Pestalozzi, not even Locke, Milton, or Dr. Samuel Johnson, looked at the matter from the scientific standpoint which takes into account: first, the physiological laws which govern the growth and development of the brain; secondly, the exterior stimuli for promoting that growth most successfully; and thirdly, the kind and quantity of knowledge and skill one must have in order to meet most completely the demands of a carefully-selected occupation.

The history of education is full of the records of whims and fancies, of experiments real and imaginary, conducted in order to prove the worthlessness of some theories and the worthiness of others. Every parent has a dimly-defined theory of how his boy ought to be educated, and every teacher looking back over his own experience as a pupil formulates more or less clearly a "system" for the proper education of his pupils. It goes without saying that such theories and so-called systems are generally shallow and inadequate, and I say this with no disrespect to either parent or teacher. I am both a parent and a teacher, and I know only too well how inevitably we theorise and plan, and how inevitably we go astray through lack of scientific guidance.

I do not claim to have formulated the science of education, and I know of no one living who has ventured to make such a claim; and yet I believe that a science of education is possible—and it is high time that we set about a systematic study of its essential features with a view to a formal statement of its main principles.

In his "Tractate on Education" Milton defined a complete and liberal education to be that "which fits a man to perform justly, skilfully, and magnanimously all the offices, private and public, of both peace and war." That is comprehensive enough, yet Milton had in mind only the offices which pertain to the five professions which were then open to liberally educated men, viz., those of the lawyer, the physician, the clergyman, the soldier, and the gentleman. A "gentleman" as defined by Milton was one "who retires himself to the enjoyments of ease and luxury." He had no thought then, as had not the educational writers of ancient or mediæval days any thought, of the sixth estate, the great mass of the people who are coming to be the characteristic force in the civilisation of to-day, viz., those actively doing the world's work, the constructive and distributive, and providing agencies of modern life. We are offering education to-day to every child, a comfortable home to every family, citizenship and self-respect to every graduate of our schools. The education we must study is the universal education of the people. We have put science, and ever more science, into the world's work; we must now give science and culture and skill to the world's workers.

When a privileged class lived in luxury, relying upon the labour of slaves who were purposely and sometimes legally kept uneducated, and when education for culture and the accomplishments of polite society were natural and logical, it was not surprising that philosophers should hold that practical affairs were degrading. Seneca, who lived in the first century, was indignant because Posidonius had so far forgotten himself as to credit philosophy with the invention of the arch and the introduction of the uses of metals.

Philosophy, according to Seneca,¹ "had nothing to do with teaching men how to rear arched roofs over their heads; and they were not concerned with the various uses

of metals. She teaches us to be independent of all material substances, of all mechanical contrivances." The wise man, said the Roman philosopher, lives according to nature. Instead of attempting to add to the physical comfort of his species, he regretted that his lot was not cast in that golden age when the human race had no protection against the cold but the skins of wild beasts, no screen from the sun but a cave in the earth. To impute to a philosopher any share in the invention or improvement of a plough, a ship, or a mill was an insult. The invention of such things, wrote Seneca, is drudgery for the lowest slaves. Philosophy lies deeper. It is not her office to teach men how to use their hands. The object of her lessons is to form and nourish the soul.

The above wish of Seneca can be fairly paralleled by an utterance of Matthew Arnold in his famous essay on "Sweetness and Light" (a phrase he borrowed from Swift). Arnold asks, with no evidence of doubt as to the superiority of the "brave days of old":

"If England were swallowed up by the sea to-morrow, which of the two, a hundred years hence, would most excite the love, interest, and admiration of mankind—the England of the last twenty years, or the England of Elizabeth, a time of splendid spiritual effort, but when coal and our industrial operations depending on coal were very little developed?"

That is, he would prefer an age when they had no mills, no canals, no steam engines, no railroads, no steamboats, no manhood suffrage, no common schools, few books, few newspapers, and few magazines, because a great majority of the people of England could neither read nor write. *De gustibus non*—as I always say of Ruskin.

I have quoted Seneca at some length because he is a type of a class of people, ancient, mediæval, and modern, who, living like Seneca in great luxury upon their income, look with disfavour, if not contempt, upon all studies which have, or may have, a positive value in multiplying human comforts and in ameliorating human sufferings.

It is not many years since a president of Princeton University expressed his regret that the higher mathematics had been found useful in the study of electrical appliances, for, said he, "as the utility of a subject increases its educational value decreases." Such was the view of the fathers and the disciples of Greek philosophy from Socrates to Patton, but such was not the view of Lord Bacon, and Lord Macaulay, and Prof. Huxley, nor is it your view, I trow; certainly it is not mine. I would as soon adopt the educational scheme of Machiavelli as that of Seneca. The former in all frankness and candour pictured the intellectual and moral dishonesty and hypocrisy of his time; but his life was relatively clean. As for Seneca, he sang the praises of virtue and literary culture, and then closed his career by an exhibition of meanness, ingratitude, and corruption which threw a blanket of infamy over his fine advocacy of a philosophy which was to form and nourish the soul.

Is it not evident from the standpoint of the subjects to be studied that we need a science of modern education? Educational values are to be determined, taking into consideration age, sex, environment, taste, brain development, and probable sphere of usefulness.

THE DOCTRINE OF INTEREST.

Here two important subjects crowd upon me for consideration. They are closely related, and I suspect they are strictly modern. I refer to the doctrine of interest, as a valuable or as a harmful characteristic of study; and to the wisdom or the folly of a free election of studies in our

¹ Epistola 90.

secondary schools and colleges. Consider for a moment how much we are at sea and how far we have drifted apart on these two matters—and then you will agree with me as to the need of systematic study and observation that we may find our bearings and lay our courses correctly.

The question of taste and interest is a very perplexing one. Antecedent interest is, we all know, quite accidental and a very unsafe guide. The whims of boys and girls are generally due to the suggestions of companions and of external opportunity. It has been my fortune, as well as my duty, to warn hundreds of parents of boys from fourteen to eighteen years of age not to take seriously their early interest in particular studies or their haphazard plans for future occupation.

Some choice is inevitable, and plans for the distant future are as plentiful as castles in Spain, but nothing can be more evident than the unfitness of a boy in his teens to select definitely the course of study best suited to his inherited and acquired capacity; and nothing can be more certain than his practical ignorance of the conditions of a successful career. Hence his declared preferences and elections are to be treated with a loving sympathy, as are a hundred other youthful fancies, but the wise parent and the wise teacher decide to leave open all the avenues of culture and skill, and to hold off the great final choice until the boy has had time and opportunity to make two important discoveries, viz., the intellectual world within him, and the material and spiritual world without. Here we need the pronunciamento of science, telling us how much weight we shall attach to the preferences of a boy of twelve, of fifteen, of eighteen, in regard to the scheme of education and training which shall enable him to make the most of himself and be of the most use to his time and generation.

Every good teacher aims to make his subject as interesting as possible to his pupils. If they fail to take a lively interest in it, something is wrong; either it is not properly presented, or it is over their heads, or it is clearly of no earthly use. Natural lack of capacity on the part of the child is rarely a valid reason for failure if the child be healthy and normal. I have learned to discredit the truth of the oft-told tale that "John has no capacity for" such a subject—mathematics, for example. "He never could learn mathematics—he takes no interest in algebra and he hates geometry," &c. Our higher schools and colleges are full of young people who protest vigorously that they never could and never can understand, or take any pleasure in, or gain any profit from, certain studies. On the other hand, I firmly believe that every normal person, at least nine out of ten of the children and youth at school and college, can fairly master and actually enjoy and profit by not only mathematics, but by every subject in the curriculum, if it be properly taught, and under proper conditions as to age and preparation.

A word more about the importance of interest as a condition of healthy mental growth. I maintain that attention is as necessary to the growth and development of the brain as exercise is to the development of a muscle, and that interest is the condition of a lively attention. When in a school- or lecture-room the limit of close attention is reached, the lesson or lecture should close, for the educational process has already stopped. It is not only useless, but it is worse than useless, to go on when the class or audience refuses for any reason to attend. I therefore doubt the educational value of subjects which are not, and perhaps cannot be, made interesting.

Of course I do not claim that all selected studies can

be made equally interesting, or that any one study can be made equally interesting to all pupils, even when the pupils are properly graded; but I do claim that a lively interest is necessary, and that educational progress is very nearly proportional to the strength of that interest. But all educators do not agree with me here.

ATHLETICS.

Never, since the days of Grecian games at Olympia, has physical culture, including field athletics, been so prominent a feature of student life as now. We can truthfully say that to-day athletics is the most conspicuous part of an academic education. Unquestionably the curriculum is out of balance, and a readjustment is necessary. The healthy, normal boy (and, I may add, the healthy, normal girl) requires and enjoys vigorous exercise in the shape of games. While I advocate rational athletics, I deeply deplore semi-gladiatorial exhibitions which put the emphasis in the wrong places, and mislead and demoralise the entire student-body. There has been a drift backward of late years towards a species of barbarism which we had fancied we had outgrown. It becomes scientific men to restore, or better, to establish, a condition of educational equilibrium.

PHYSIOLOGICAL PSYCHOLOGY.

Perhaps the most valuable contribution to the science of education has come through a study of the laws which obtain in the growth and development of the brain, and the conditions under which that growth and development is most healthy and complete. There are times and seasons for the development of the mental and moral faculties as there are of the physical faculties. While such times and seasons are not precisely the same for all children, we find that all attempts at premature development are not only worthless, but are permanently injurious. Precocity is now regarded as a species of brain deformity. Plants and animals may be forced, and unusual and interesting results may be produced by forcing, but no one of us wishes a son or a daughter to be a prodigy in one direction at the cost of normal development in other directions.

MANUAL TRAINING.

Closely related with this of brain culture is the subject of manual training, which has recently gained a foothold in our scheme of rational education.

A study of the whole field of education, classical and technical, led me, in 1879, to organise a school for boys of high-school age in which manual training should be combined with intellectual training; to put the liberal arts and the mechanic arts side by side in the same curriculum; to deal simultaneously with material forces and appliances and with spiritual forces and appliances; to cultivate not alone or chiefly the memory and the understanding, the eye to read and the mouth to speak, but the judgment and the executive faculties as well; to extend the humanities so as to include human interests and human activities as they exist now and here. Many wise and excellent educators had grave fears as to the result of the experiment. It was thought that the introduction of tools, machinery, materials, the theories of construction, and draughting might not only break up the orderly programme of the school, but they would lower its intellectual and moral tone. It is now known that all such fears were groundless. Manual training, when properly adapted to the boy's status of brain development, and when incorporated into the daily and weekly programme with due regard to the other essential features, has proved to be a more

valuable element in education than even the most sanguine advocate dared to expect. The moral, intellectual, and economic fruit of this combination, as shown in the characters and careers of the boys who formed the first classes in the pioneer schools, is the best possible evidence of its value. The gloomy predictions made of its effect upon the pupils, and upon our American system of schools, have been forgotten, and early opponents are fast friends and enthusiastic advocates.

This is no place or time for me to give an exposition of manual training; I have preached its gospel elsewhere and often. But I mention it as one of the important matters which must be carefully weighed and adjusted. We must defend it from frivolity on the one hand, and from misdirection and undue emphasis on the other. At first it was suspected that our motives were sordid; that we were likely to degrade our schools, to teach narrow trades, and to turn out "mere mechanics" instead of educated men. On the other hand, a recent report of a Massachusetts commission (for the membership of which I cherish high respect) regards the manual training movement as almost exclusively educational and not sufficiently industrial. I suppose the earlier and the later estimates are still held by many sincere and able teachers. One does not easily lay aside the convictions of a lifetime. The manual training movement stands inevitably as a criticism upon the system of education which came down the ages through the fathers to us, and naturally the latter stands on the defensive. It is also a standing reproof to the old wasteful, unscientific method of teaching to apprentices the theory and uses of tools. It is for educational science to justify the ways of progress which lays aside the idols of the past and erects new temples and opens new kingdoms. Of all the temples, none is finer, none is more glorious, and none should be more scientifically planned and reared than that of education. While no section of this association can enforce the dictates of science, it would be helpful if we were able to establish these two things as true, viz. :

- (1) That usefulness does not impair educational values.
- (2) That a so-called culture-study like Latin may properly stand side by side with manual training in the curriculum.

We are all pleased (though perhaps surprised) when we learn that a man who reads blue-prints, and can make and use a diamond-point machine-tool, is also a linguist and at home in the calculus; and yet we are more than likely to assume that the boys who are studying the theory and use of tools have little need of literature, and that the student of the classics is wasting his time in a laboratory of the mechanic arts.

THE NEW EDUCATION.

The evolution of the fully fledged technical school, or the technical department of the university, has taken place during the last half century, and yet its broad, stimulating, attractive features have a following which bids fair to double the attendance of college and university students. This does not mean that letters and polite learning are being neglected, but that a new constituency is eager for the new education. This new education, though it recognises at all points a high order of usefulness, and contains little that is conventional, is only remotely professional. If ever its curriculum becomes narrow, it is quickly condemned by the best representatives of an education which combines utility with culture. No longer can the "Levites of culture," as Huxley calls them, claim to monopolise liberal education. The new education can be

as liberal as the old, and both can be narrow. Fortunately, they flourish side by side, and the future shall choose the excellencies of each. An adequate science of twentieth-century education will evaluate the characteristics of each, and bring the wisdom of the past, not its foolishness, to nourish the wisdom of the future.

OXFORD LOCAL EXAMINATIONS. SET SUBJECTS FOR 1908.

Preliminary.

Religious Knowledge.—(a) Ezra, Nehemiah, (b) St. Luke (chap. vi. to end), (c) Acts (chap. xvii. to end), (d) Church Catechism.

English History.—Either the Outlines from 1066 to 1300, or the Outlines from 1399 to 1603, or the Outlines from 1603 to 1714, or the Outlines from 1714 to 1815, or the Outlines from 1815 to 1880.

English Author.—Either (a) Lamb's "Tales from Shakespeare" (First Series) or (b) "Poems of England," by George and Sidgwick (xi.-xvi., xxv.-xxviii., xxxii. to end). Either (a) "Robinson Crusoe," part i., or (b) Longfellow's "Hiawatha."

Geography.—(iii) The geography of one of (a) England and Wales, or (b) Scotland and Ireland, or (c) India.

Elementary Latin.—"Tales of the Civil War," by W. D. Lowe.

Elementary Greek.—Sidgwick's "First Greek Reading Book" (ed. ii.), Exx. 1-35, 51-60.

Elementary French.—Either Pressensé's "Seulette" or Tocqueville's "Quinze jours au désert."

Elementary German.—Niebuhr's "Heroengeschichten."

Junior.

Religious Knowledge.—(a) Ezra, Nehemiah, Esther, (b) St. Luke, (c) Acts (xii. to end), (d) Prayer Book.

Ancient History.—Outlines of Greek History from 445 to 323 B.C., with special questions on the Peloponnesian War.

English History.—(a) Outlines of English History from 1066 to 1399, with special questions on the period 1135 to 1216; or (b) Outlines of English History from 1399 to 1603, with special questions on the Reformation in England; or (c) the Outlines of English History from 1603 to 1714, with special questions on 1688 to 1714; or (d) the Outlines of English History from 1714 to 1815, with special questions on the period 1756 to 1783; or (e) Outlines of English History from 1815 to 1880, with special questions on the period 1859 to 1880.

Early English History.—Outlines of English History from 55 B.C. to 1135 A.D.

Foreign History.—Outlines of General European History from 1715 to 1795.

English Literature.—Either (a) "Poems of England," by George and Sidgwick, or (b) Shakespeare's "Richard II." Either (a) Shakespeare's "Julius Caesar" with North's translation of Plutarch's "Caesar," or (b) Shakespeare's "Merchant of Venice," or (c) Scott's "Old Mortality" or Scott's "Marmion." Either (a) Tennyson's "The Marriage of Geraint," "Geraint and Enid," "The Passing of Arthur," or (b) Kingsley's "Westward Ho!" Hakluyt's "Voyages of Elizabethan Seamen" (ed. by C. R. Beazley), "Voyages of Hawkins, Frobisher, and Drake," "The Oxford Treasury of English Literature," vol. i. (chap. v. to end), by G. E. and W. H. Hadow.

Geography.—General: (i) Geographical Principles, (ii) British Isles, (iii) one of (a) Mediterranean region, (b) Monsoon region of Asia, (c) Atlantic region of North America.

Latin.—Caesar, *De Bello Gallico* I.; Virgil, *Aeneid* I.

Greek.—Xenophon, *Anabasis* I.; "Selections from Plutarch's Life of Julius Caesar," by du Pontet.

French.—Either Karr's "Voyage autour de mon jardin" or Racine's "Esther."

German.—Richl's "Seines Vaters Sohn" and "Gespensterkampf."

Senior.

Religious Knowledge.—(a) Ezra, Nehemiah, Esther, (b) St. Luke, (c) Acts, (d) 1 Corinthians, (e) 1 Corinthians in Greek, (f) The Apostles' Creed, together with the Articles of Religion, i.-viii.

Ancient History.—Outlines of Greek History from 445 to 323 B.C., with special questions on the Peloponnesian War.

English History.—Either (a) English History, (i) 1066-1399, or (ii) 1399-1603, or (iii) 1603-1714, or (iv) 1714-1815, or (v) 1815-1880.

Early English History.—Outlines from 55 B.C. to 1135 A.D.

Foreign History.—Outlines of General European History from 1715 to 1795.

English Literature.—Either (a) Milton's "Comus," "L'Allegro," "Il Penseroso," "Sonnets," or (b) Shakespeare's "Richard II." Either (a) Shakespeare's "Julius Caesar" with North's translation of Plutarch's "Caesar," or (b) Scott's "Old Mortality," or (c) Scott's "Marmion." Either (a) Bacon's Essays, 1-40, or (b) "Selections from Wordsworth," by Matthew Arnold (omitting "Reflective and Elegiac Poems"), or (c) Tennyson's "The Coming of Arthur," "The Marriage of Geraint," "Geraint and Enid," "The Passing of Arthur." Either (a) Hakluyt's "Voyages of Elizabethan Seamen" (ed. by C. R. Beazley), "Voyages of Hawkins, Frobisher, and Drake," or (b) "Essays on Addison," by Macaulay and Thackeray (ed. by G. E. Hadow), "The Oxford Treasury of English Literature," vol. i., by G. E. and W. H. Hadow.

Geography.—(i) Principles of Geography, (ii) British Empire, (iii) one of (a) Europe, (b) Asia, (c) North America (including West Indies).

Latin.—(a) Caesar, *De Bello Gallico* I., II., or (b) Virgil, *Aeneid* I., II. Either Livy XXI. or Horace, Odes I., II.

Greek.—(a) Xenophon, *Anabasis* I., II., or (b) Euripides, *Alcestis*. Either Thucydides IV., or Sophocles, *Ajax*.

HISTORY AND CURRENT EVENTS.

We were referring recently in these columns to the language used by the president of the Indian National Congress. We pointed out how it was borrowed from "Liberal" statements of our constitution and its history, and how strange it seemed as applied to the "people" of India. Now we have to hand the last of Lord Cromer's statesmanlike reports on Egypt and the rule of that country as conducted by himself in his capacity as British representative. A large part of that report is devoted to an examination of the principles and methods of the Egyptian "Nationalist" party. He examines how far they consist of Pan-Islamism, i.e., how far they are religious in character, and thinks that this feature is perhaps predominant. But he also points out the relations of the movement with

desires for or against the power of the Turkish Sultan, and how complicated the whole agitation is. But the parallel with the Indian National Congress movement is seen in this, that Lord Cromer attributes the anti-European movement partly to the very success of European intervention in the country, and to the consequent well-being which gives the leisure necessary for agitation. Only from Europe comes the desire to share in the functions of government which now begins to show itself in Oriental countries.

But the difficulty of diagnosing these diseases (shall we call them?) of the State is not confined to Egypt. The last year or two have seen movements in several countries that have an outward resemblance, but which we should do well to refer to totally different causes. In Hungary, e.g., events are happening which are specially interesting to school teachers. The emoluments of teachers in that country are "to depend in future on their zeal in extending the knowledge of the Magyar language and in developing among non-Magyar children sentiments of devotion towards the Magyar State." In 1848 the Magyars were defeated in consequence of Austria being able to rouse against them the surrounding nations whom they had oppressed in their hour of triumph. But history is not always determined on the battle-field, and now, in the uneasy relations between Magyar and non-Magyar in the Austro-Hungarian empire, other methods are to be tried to win the final victory for the Magyar nation. Will they succeed any better than the old ones?

"History is not always determined on the battle-field." And we turn to South Africa, where Great-Britain-and-Ireland is carrying out the policy which she began to learn a hundred years ago, and is granting self-government, even responsible government, to that mixture of races which we now call the Transvaal Colony. It is beginning to be possible to have a deliberate opinion on the wisdom and policy of the last Boer war, and on the long series of events which led up to it. That war apparently settled that the Boer was not to have the last word in Transvaal and South African policy. At least it anticipated by a year or two the end of a dominating person. But now we have advanced at a bound from the methods of seventeenth-century England and of South American republics to the methods of nineteenth- and twentieth-century Great Britain. The fight still continues, but it is to be at the polls only, not on the battle-field, and Louis Botha, who was our enemy not many years ago, is now representing one of our colonies in our Colonial Conference.

And, finally, we note that in these days, when European influence is spreading all over the world, this "national" movement, which has so many causes and so many features, is shaping itself here and there in endeavours, more or less successful, to have representative institutions similar to our Brito-Irish Parliament. Russia is struggling to get a Duma satisfactorily at work; even Persia and Afghanistan are making efforts in the same direction. What are the advantages of this method of voicing a nation's wishes over those of other methods, such as that of Israel when they sent Ehud to Eglon, or that of Greeks and Bulgarians in Macedonia, or that of Raisuli and others in Morocco? We in this country are familiar with its disadvantages, the slowness and difficulty of changing a government, even one which has become unpopular; and we are not so quick to perceive that it is of great advantage to the rulers, if only they will listen to it. But it seems difficult to make it work where the country is too big, i.e., has too many rival nations who want to fight rather than talk and vote.

ITEMS OF INTEREST.

GENERAL.

THE Federal Conference on Education in connection with the League of the Empire, to which we have already directed attention in these columns (vol. viii., p. 469), will be held in London from May 24th to June 1st. A very full programme has been arranged. The business subjects include : (a) Scheme proposed by the League of the Empire for federation of the Empire in education; (b) official recognition of a common central office for federal education; (c) future federal education conferences—(i) suggested places of meeting of heads of departments and other educationists, (ii) dates. The educational subjects to be discussed are very numerous, and among them are included : (a) Teachers—(i) comparison of (a) the provisions for the supply and the training of elementary-school teachers, and of (b) the conditions of their work in the United Kingdom and other countries of the Empire and Crown colonies; (ii) similar comparison in the case of secondary-school teachers; (iii) practicability of temporary interchange of teachers and of inspectors between the United Kingdom and other countries of the Empire and Crown colonies. (b) The relations between secondary and primary schools in the various countries of the Empire. (c) Means of establishing a system of mutual recognition of equivalent standards of attainment in the several countries of the Empire in connection with primary, secondary, and university education. (d) Co-operation in educational publications. (e) Co-operation in school work. (f) School subjects. (g) Education of non-British races. (h) Other subjects, such as metric weights and measures and school gardens, which may be discussed if time allows. Full particulars concerning the conference may be obtained from the honorary secretary to the League, Mrs. Ord Marshall, Caxton Hall, Westminster, S.W.

We have received a copy of a recommendation for revised syllabuses in mathematics recently placed before the Board of Education by the Council of the Association of Teachers in Technical Institutions. That such a recommendation should have any weight with the Board of Education is a significant sign of the times; that it has weight is shown by the recent revision of the chemistry syllabuses, due to action by the Council of the A.T.T.I. While we are heartily in accord with the idea that examiners are for the public good, and not the public for the good of examining bodies, we cannot altogether agree with the proposed syllabus or some of the leading principles which underlie it. It is stated as one of these principles "that the inclusion of practical mathematics as a separate subject releases the Board from the necessity for considering purely technical students." Our idea is that the more purely theoretical mathematics the technical student can be coaxed to absorb the better for him; not so much, perhaps, for the facts and facility he obtains, but for the logical training he receives. Anyway, the technical student *cannot* be overlooked. A student crammed with facts and formulæ only is not likely to become a man who "wants to know the reason why." If, on the other hand, the syllabus is designed for "mathematicians," why the necessity of "problems that are simple and in many cases numerical"?

WE doubt whether the syllabus can in any way be said to "indicate the trend of mathematical thought in this country," even if it does that of teachers in technical institutions. We are convinced that many would prefer the present scheme of the Board of Education even as it

stands, and in a greater degree if the algebra and geometry were revised. As the Council recommends the whole of the Cambridge syllabus (easy treatment, nevertheless) for Stage I., together with about five lessons' work on algebra—"to linear equations and graphs," most of this being usually treated as generalised arithmetic or examples in geometry—it is evident that the scheme is very badly balanced. If the Cambridge syllabus be adopted for Stages I. and II., it should be split into two sections, the equivalent of Euclid, Books I. and III. (without 35, 36, 37) being retained for Stage I. and the rest for Stage II. Finally, it must be remembered that assistant-masters in secondary schools under the Board should surely have a say in this matter, and no notification of any memorial from them has yet come under our notice.

THE executive committee of the English Association, appointed at the general meeting held last January to hold office for the present year, has held a number of meetings, and has now issued in revised form the prospectus of the association for 1907, including a statement of its objects, methods, and constitution, and a list of officers. Dr. Butler, Master of Trinity College, Cambridge, has been elected first president, and will give an address at the next general meeting. A sub-committee has been appointed to deal with the publications of the association. It has been arranged that for the present these shall be mainly in the form of leaflets. A list of subjects bearing on the study of English language and literature has been drawn up, and leaflets upon these subjects are being prepared. Local branches of the association are being formed at Liverpool, Birmingham, and Bristol. All correspondence relating to local branches (except in Scotland) should be addressed to Mr. G. E. S. Coxhead, the Grammar School, Hinckley. The Scottish branch of the association has held meetings in Edinburgh, Dundee, and other centres. The hon. secretary is Mr. J. I. Low, the High School, Stirling. Copies of the prospectus of the association and forms of application for membership (otherwise than through the local branches) can be obtained from the hon. secretary, Miss J. Laidler, Goldsmiths' College, New Cross. Other communications should be addressed to the hon. general secretary, Prof. F. S. Boas, Cranford, Bickley, Kent.

A MAY DAY of Shakespeare's time, in connection with the Shakespeare commemoration organised by the London Shakespeare League in aid of the Guild of the Brave Poor Things, was held at King's College, London, on April 24th. The Duchess of St. Albans presided. Two hundred children from the Bermondsey University Settlement Guild of Play took part in the pageant, dressed as villagers, morris dancers, courtiers and ladies of the period, archers, bargemen, the hobby horse, clown, Maid Marian, Dragon, Will Scarlet, Little John, Robin Hood, Tom the Piper, Friar Tuck, &c.; and the programme included the Plaiting of the Maypole to music of the Elizabethan period, the traditional Visit of Queen Elizabeth to the Earl of Leicester, the famous "Greensleeves" Dance, Singing Games and Folk Songs, the Morris Dance and others.

THE seventh biennial congress of the World's Student Christian Federation was held at Tokyo from April 3rd to 7th. The congress was one of particular interest, as it was the first international congress ever held for any purpose in Asia. Five hundred delegates, of whom four hundred were Asiatics, representing thirty different countries, took part in the congress. The British delegation included Sir Alexander Simpson, of Edinburgh, and Prof. Macalister, of Cambridge. Other persons present as

speakers were the Hon. John Wanamaker, Sir Harnam Singh, and Mr. J. R. Mott, general secretary of the Federation. The World's Student Christian Federation, which has a membership of more than 113,000 students and professors, aims at the promotion of Christian life and work in the universities of the world; it was founded in 1895, and is rapidly becoming one of the strongest influences in university life.

AMERICAN visitors to Europe are apt to talk as if all children of every social grade were educated together in the public schools of the United States. The report of the Mosely Commission, with its reference to the son of the President learning side by side with the labourer's child, has given some readers the idea that private schools are unknown in the States, and that the American parent never seeks a select academy in preference to the public school. Statistics contained in the second volume of the most recent report of the U.S. Commissioner of Education, however, show that of 822,235 boys and girls attending secondary schools in the United States during 1903-4, 169,431 were being educated in private schools. Of 36,326 masters and mistresses engaged in American secondary schools during 1903-4, 9,566 were at work in private and 26,760 in public schools. But whereas the average number of pupils per teacher in the public secondary schools was twenty-four, there was one teacher to every ten pupils in the private schools.

THE report of the U.S. Commissioner throws much light, too, upon the relative popularity in American schools of the various subjects of the secondary-school curriculum. The most popular subject is algebra, which appears to include any work in arithmetic done by the pupils of secondary schools; 56 per cent. of the total number of pupils in these schools study this subject. The subjects which come next in popularity are as follows, with the percentage of the total number of students in each case: Latin, 50 per cent.; English literature, 48 per cent.; rhetoric, 45 per cent.; history (other than that of the United States), 39 per cent.; and geometry, 27 per cent. The most popular subject of science is physiology with 23 per cent. of the total number of students, and physics comes next with 16 per cent. The same subjects appear to meet with the approval of boys and girls equally. It seems clear that American authorities encourage the development of what are often called "culture" subjects in secondary schools, and do their best to postpone serious work in science for the technical grade.

EDUCATIONAL methods are, as a rule, purely empirical. The claims of this or that kind of study are advocated by various prophets, and teachers learn by experience which processes produce the best results, whether measured by examinations or any other standard, but there is as yet no educational science. Education is, indeed, in much the same state as natural history was before Darwin found the key to organic evolution: much material is available, but the simple principle which will gather together all the disconnected threads and be to education what the doctrine of evolution has been to biology remains undiscovered; or if discovered, it is not generally accepted. In an address on "Child-nature and Education," recently delivered by Miss Hoskyns-Abrahall before the Manchester and Salford Sanitary Association, education is considered from the biological standpoint—biology being taken to include physiology, anthropology, bio-chemistry, biophysics, and other branches of knowledge concerned with physical and mental development. It can easily be understood that, viewed in this way, the methods at present employed in nurseries, schools, and colleges are mostly

without scientific justification. Our educational system is not founded upon the evolutionary principle that the development of the individual is the miniature history of the species, and therefore it lacks coherence. Miss Abrahall describes the course which the biologist-educator would adopt in order to promote the growth of the best features and faculties of children at various ages. Theoretically, her scheme is sound enough, but the changes involved are of such a revolutionary character that it is too much to expect that it will meet with general acceptance in our day and generation. But though the scheme may be considered impracticable, Miss Abrahall's paper is none the less suggestive, and is a noteworthy contribution to educational science.

A COURSE for helping women desirous of extending their knowledge of nature-study will be held at the Horticultural College, Swanley, from July 27th to August 10th. Most of the instruction will be given (weather permitting) out of doors, rambles in the country under the guidance of experienced teachers being the chief feature. Miss Hibbert-Ware, science mistress, Queen Margaret's School, Scarborough, and Mr. Tabor, resident science lecturer, will lead combined excursions for studying birds, pond life, insects, wild flowers, trees, grasses, &c., in their different environments. The college gardens, greenhouses, orchards, farm, and fruit-preserving appliances will be in working order, and students will be able to obtain an insight into the work carried on in each department. Miss M. Agar will give demonstrations and instructions in simple gardening, and on the care of school gardens. Demonstrations in dairying and poultry keeping will be given by Miss M. Dawson, who will explain the chief points of farm operations during the year. So far as possible, the open-air studies will take place within easy distance of the college, but excursions will be arranged to districts with varying soils and climate, and the accompanying variety of natural objects. Students having bicycles are advised to take them. It is hoped to combine the natural-history excursions with points of antiquarian, artistic, and other interest in outlying districts, and endeavour will be made to render the course useful, both for home life and school work. Applications for forms of entrance and further details may be made to the Principal at the college.

THE detailed prospectus of the Holiday Course for Foreigners arranged by the University of London has now been issued, and the list of lectures is very attractive. Prof. Hall Griffin will give seven lectures on Tennyson and Browning, and Mr. Allen Walker will give a course on Historic London, in connection with which there will be visits to typical buildings. Mr. Fuhrken, lecturer at Gothenburg, will discuss Mr. Bernard Shaw, whose dramas have recently attracted much attention on the Continent; he will also speak of English university life, in connection with the visit to Cambridge. Mr. Alfred Milnes has promised three lectures on economic subjects; Mr. John Lea will give a lantern lecture on the Painter as Moralist; Mr. Classen, Lector at Upsala, will speak on English educational methods and some social reforms of the nineteenth century; and Mr. H. W. Atkinson will give a lantern lecture on Life in South Africa. Prof. Rippmann, the director of the course, will lecture on the Phonetics of Modern English. The prospectus and all further particulars can be obtained on application to the Registrar, University Extension Board, University of London, South Kensington, London, S.W.; the words "Director of the Holiday Course" should be added in the left top corner.

CANDIDATES who wish to sit for the coming examination for appointments as assistants of Excise must send in applications on or before May 9th. This examination is the first under the new scheme (vol. viii., p. 193). The salaries and age limits are shown in THE SCHOOL WORLD, vol. viii., p. 430.

AN examination for two appointments in the Army Accounts Department and for one in the Exchequer and Audit Department will commence on June 4th. The last day for making application is May 15th. This is the first examination under the regulations explained in vol. viii., pp. 356 and 430. Candidates must be between 18 and 19½ on May 1st. The salary during the period of probation is £100 a year; the departments are new and homogeneous, and hence offer very good prospects.

JUNE 20TH is the last date for application for admission to the competition in July for appointments as assistant-clerks (abstractors). Age limits and prospects have been given in THE SCHOOL WORLD, vol. viii., p. 227.

SCOTTISH.

THE four Provincial Committees on the Training of Teachers have adopted, after very little consideration, certain proposals bearing on curricula, bursaries, and periods of service for students in training. The whole scheme, so far as it has been made known to the public, is vitiated by the undue importance attached to the professional subjects. Under the old *régime* it is admitted that the practical side was too little regarded, but now the wheel has turned full circle in the opposite direction, and culture studies have gone by the board altogether. The position taken up seems to be that students, having passed successfully through the full curriculum of a secondary school, should, on entering the training colleges, be ready for a purely technical course as a preparation for school work. No greater failacy could possibly be imagined, and the whole scheme seems based on the old heresy that the less a primary teacher knows the better he will teach. If students in training entered the colleges possessed of the full leaving certificate something might be said for the position taken up by the Provincial Committees. But it is notorious that the great majority will never attain to that level, and to regard their education as completed at the comparatively paltry standard of the junior certificate is to court disaster for the public-school education of Scotland, which has been built up on quite other foundations than these.

MR. STRUTHIERS, the secretary to the Scotch Education Department, has issued a summary of recommendations in regard to the pronunciation of Latin as drawn up by the Classical Association of Scotland. Henceforward, unless formal notification to the contrary be made beforehand, and unless good reason can be shown for departure from the accepted convention, the recommendations of the Classical Association will be looked for in all schools under Government inspection, though the new pronunciation need not be introduced in the senior classes. It is further pointed out that the aspect of Latin pronunciation most liable to be neglected in Scottish schools is quantity—the very element that is of supreme importance for a proper understanding of Latin poetry, as well as for a due appreciation of some of the highest qualities of Latin prose style.

THE spring meeting of the Classical Association was held this year in Aberdeen. Prof. Ramsay, who has been persuaded to continue as president of the association, discussed the question of "unseen" as against prescribed work in classics, and he advocated that in school examinations, at least, unseen should be very sparingly used.

The undue stress laid upon unseen has led to the indiscriminate use of selections and extracts, and to the neglect of the great masterpieces of literature. As an alternative to unseen, Prof. Ramsay thought that examination boards should announce beforehand that the translation would be taken from a fairly wide range of books and authors. The difficulty in working such a scheme would be that the scope of the reading might be so wide as to entail slipshod work in order to cover the ground, or so narrow that the old memory translations would once more come into vogue. The ideal plan is to limit the unseen to easy passages, so that they may be within the powers of any pupil who has had a good grounding in the essentials of Latin syntax, and whose reading has given him a command of a fair vocabulary. Certainly some protest is required against the absurdly difficult character of the unseen that now appear in almost all examination papers.

THE first annual general meeting of the Scottish branch of the English Association was held at the Glasgow University. Prof. Saintsbury presided over a large attendance that promised well for the future of the association. Principal Williams, of Dundas Vale Training College, in speaking of the aims of the association, put in a plea for research work into the different forms of the Scottish language. He pointed out that in a few years much valuable matter bearing on Lowland Scotch would have disappeared, and it might well fall within the province of the branch to collect, systematise, and preserve this. In the direction of grammar, composition, and literature quite a number of problems awaited discussion and settlement, such as the place and time to be given to phonetics, the best methods for teaching composition, and the extent to which rhetoric should be taught. There also remained a whole series of vital questions in regard to the teaching of literature. For instance, to what extent were they going to teach the history of literature; how were they going to settle what kinds of literature should be taught in schools; how far were they to allow the pupil's individual taste to guide his choice of home reading; and how far was it in the teacher's power to mould the pupil's taste?

MR. J. C. SMITH, H.M. inspector of schools, read a paper on the "Teaching of Poetry." He expressed the opinion that poetry was an end in itself, and was one of the good things of life that required no more justification than the colour of a sunset or the intercourse of friends. In teaching poetry he advocated that attention should be given to form and rhythm rather than to matter, and that it should be dealt with from its aesthetic side, leaving its moral influence to make itself felt in its own way. In the afternoon, Prof. Saintsbury delivered an address on "The history of the English language as an organ of speech and literature."

MR. ALEXANDER URE, M.P., Solicitor-General for Scotland, in addressing the congress of class teachers at Perth, referred to the subject of superannuation. He said that this question was perennially dear to the heart of a schoolmaster, and seemed to afford them a weird, mysterious, but ineffable joy in the contemplation of their latter end. As this subject would soon come before the House of Commons for consideration, he felt unable to deal with it in any detail. He might say, however, that he had not changed his mind in regard to it, that he still regarded the present Superannuation Act as a "poor, mean, shabby, beggarly return for long and arduous services." He was still of opinion that the teacher whose life work was accomplished was entitled, at least, to as much consideration as a postman or a policeman, and every endeavour to secure their just demands would have his steady support.

IRISH.

The Intermediate examinations will commence this year on June 10th, and continue without interruption every week-day until June 22nd. As this leaves a clear week over at the end of June, it would have been preferable to defer the examinations another week. The Irish school year closes with the Intermediate examinations, and very few schools reopen before the beginning of September or the last week in August, so that the summer vacation in some cases is unduly prolonged. While it would cause undue inconvenience to postpone the examinations until July, they should be held as late as possible in June. The time-table follows in the main the arrangement of last year, with three papers every day of two hours each, usually 10-12, 1.30-3.30, and 4-6. The one exception is the paper in English literature and composition, which is given two hours and a half. There are some changes in the order of subjects calculated to obviate the criticisms of last year.

THE Consultative Committee consisting of three heads of Roman Catholic and three heads of Protestant schools spent the Easter vacation in a united, and it is believed not unsuccessful, attempt to persuade the Government that the drop in the income of the Intermediate Board is a serious thing for intermediate schools and teachers, whose salaries are largely affected by it. The request made is that the Government should make good the loss to the Intermediate Board due to the increased temperance of the country and the consequent fall in the "whisky" grant, amounting during the past two years to £22,000, and should guarantee that the income of the Board should not fall below the level of years like 1903 and 1904. The Committee was anxious to form a deputation to wait upon the new Chief Secretary, but this was refused by the Castle, whereupon the leaders of the two Irish political parties were waited upon and their sympathy secured, and later an informal interview with Mr. Birrell took place with satisfactory results. The Intermediate Board has, we believe, by a reinvestment of some of its funds succeeded in raising its income for the present year by about £3,000, but this does not make good the very serious losses referred to above. Why cannot the Consultative Committee agree also upon a plan of reform for intermediate education in Ireland and urge it upon the Government?

MR. BIRRELL has made two important speeches on Irish education. The first was just before Easter in a debate in the House of Commons on primary education, and the other was at the Congress of National Teachers in the Rotunda in Dublin in Easter week. The latter was additionally interesting as being his first public speech in Ireland. The two speeches taken together are useful as containing some definite promises and some pregnant forecasts. In the House of Commons three or four specific points were raised, and on one of these only was a definite announcement made, and this was not completely satisfactory. The tone, however, of Mr. Birrell's speeches gives promise of serious tackling of the educational problem in its entirety. To remedy the scandalous state of school buildings the Treasury has agreed to provide £40,000 a year for three years for building grants; the demand was for £100,000 a year for five years. Mr. Birrell pointed out that Irish education was expensive owing to the multiplicity of small schools, many of which should be amalgamated. He promised to remedy the political disabilities of the teachers, and he admitted that the scale of their salaries was meagre and insufficient. A national

teacher starts with £56 a year, soars after many years of hard work to £75 or £80, and then, after thirty-six years' service, with extraordinary good luck he might, if he obtained the headmastership of one of the few large schools, look forward to £150 or £175 a year. Then, again, there was an urgent need for bursaries to carry children from the primary to the secondary school.

How to remedy the needs? Ireland must work out her own educational salvation. Mr. Birrell urged on all parties to come to some agreement as to what form of educational control they wanted. It was of little use to agitate for the abolition of the National Board unless they knew what they intended to put in its place. But under the Devolution scheme Ireland would be given the opportunity to set its educational house in order and to remodel its system of primary and secondary education. His idea was that all the money due to Ireland should be put into one common fund, and that it should then be distributed according to the needs of the country. The first need was the improvement of education.

WHILE Mr. Birrell is thus outlining his ideas on school education it has been stated with some show of authority that he has abandoned his predecessor's scheme of university education. Mr. Birrell has, however, lost no time in replying that the Bill will be introduced as soon as possible—a somewhat vague expression, seeing that the Parliamentary session is now well advanced—and will proceed upon Mr. Bryce's lines, with any necessary modifications. But Mr. Bryce's proposals have nowhere roused great enthusiasm even in Ireland, and have met with vigorous opposition and criticism, not only in Trinity College, but in all the sister universities of England, Scotland, and Wales, so that to carry them through Parliament without modification would seem impossible. It has been generally stated that the Bill would limit itself to the establishment only of a new Roman Catholic college under Dublin University, leaving the Queen's Colleges and the Royal as they are. But this is likely to meet with almost equal opposition.

WELSH.

THE Welsh Revolt Committee collected over £8,000, and more than £4,600 remains in its hands. Besides this, however, there is probably altogether a considerable amount still with the local and denominational treasurers yet to be passed on to the Central Committee. £2,400 has been paid to support the revolt in Merionethshire, and another £500 has been voted. The revolt schools in Montgomeryshire have received £358, and £1,059 has been paid for administrative expenses, including cost of meetings, &c. A claim is now made by Merionethshire that the emergency schools called into existence by the revolt should be placed on a permanent footing out of the balance of the funds. On the other hand, it is argued that the revolt is not dead. Yet the Merionethshire representatives warn the Central Committee that if the subsidies to the emergency schools are discontinued many children will be compelled to return to the schools from which they were withdrawn.

THE staffing of the elementary schools in Wales is a serious problem. In the Welshport district, recently, the managers of one of the schools selected from a number of applications a candidate, a girl eighteen years of age, who had only passed the sixth standard, and recommended her as a supplemental teacher. The applications were described as "most wretched." The salary offered appears to be £25 a year, without food or lodging. The recommendation of the managers was adopted. We must say that

intermediate education in Wales is indeed remarkable, if it can accomplish its work and make up for the foundation of education as given in elementary schools with staffing of this nature. If this state of things continues, the question will arise, Why should not the intermediate schools be multiplied so as to undertake the elementary as well as higher education of their districts?

AT a prize-day gathering at Machynlleth, in Montgomeryshire, Mr. J. D. Rees, M.P., observed: "The Welsh people had a keener appreciation of education and a stronger desire to avail themselves of it than the people of England and Scotland." This is what is constantly being said in Wales, and no wonder the Welsh people think it. Still, on the whole, a good criterion of educational efficiency is the state of the teacher. Let us return to the £25 a year of the previous note. This amounts, let us say, to ten shillings a week. Let us say there are twenty-five working hours to the week. The payment amounts to less than 5d. an hour. Whilst such instances as this occur, it cannot be said that there is a keen appreciation of the educator, however much the advantages of education are recognised in Wales. Nor is passing the sixth standard a guarantee of efficiency for the training of pupils. Would a domestic servant be wise to exchange for the post of teacher in the school referred to? If not, why should not the next public speaker dilate on the appreciation of the Welsh for domestic service as nobler than that of teaching schoolboys and schoolgirls? Is this the state of things a responsible public educational authority should be willing either to inaugurate or maintain? Indeed, when education is compulsory, and the appreciation of it described as so keen, the only logical position would be a revolt of parents against the ratepayers, and a demand for efficient teachers, whatever the cost. To compel parents to send children to inefficient teachers is tyranny—even if it is done by order of democratic educational (save the mark!) authorities.

AT Llangollen county school, progress is reported. The governors are making provision for school gardens, and for giving the pupils, both boys and girls, systematic scientific instruction in the management of them. The governors have also chosen a sub-committee to consider the desirability and practicability of providing a hostel for pupils. Throughout Wales, in connection with county schools, there is in the country districts a *clientèle* larger or smaller of pupils who live in approved lodgings and go home at the week-ends. But the Llangollen school governors do not consider this method makes sufficient provision for uniform supervision for school purposes. No doubt in schools of high reputation, and in the midst of healthy conditions, the "outside" element is one which may be expected to increase. At the same time, the school must be an organic whole. The lowness of fees is often a cause of attraction to the schools. Thus to the Wrexham county school, which is well known for its success, outsiders have been attracted, and have now become a difficulty. It is stated that the governors are spending £500 on the education of these outsiders, and it is complained that this is not fair to the ratepayers.

French Readings in Science. Edited by de V. Payen-Payne. vii+230 pp. (Blackie.) 3s. 6d.—Mr. Payen-Payne is to be congratulated on an exceptionally satisfactory piece of work. The selection of passages is excellent, and the notes are full of interesting information. We know of no better French reader for science students.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Das wissenschaftliche Studium der deutschen Sprache und Literatur. Von Dr. Heinz Hungerland. 45 pp. (Heidelberg: Ficker.) 1s. 3d.—This booklet is intended as a guide for students. It must be confessed that there is little need for it in England, as we have Dr. Breul's excellent book with its valuable bibliography, which takes into account books of special value to the English student of German. The list of books recommended requires supplementing; thus Klee's "Grundzüge der deutschen Literatur" is far better than Kluge's book, and instead of Graff's dictionary, which is very difficult to obtain, Schade should have been mentioned. Freytag's "Journalisten" should have found a place among the dramas (chapter xx.). Nothing is said about methods of teaching. The frequent use of *entbehrlieche Fremdwörter* is distressing; we find *Direktive, Hauptakzent, Kausalnexus, Exkursionen, interpretieren*. Misprints are also too common.

G. Frenssen, Gravelotte. Edited by Otto Heller. xx+66 pp. (Ginn.) 1s.—"Gravelotte" is chapter xiv. of Frenssen's striking novel "Jörn Uhl." It is a thoroughly stiff piece of German, racy and idiomatic; only advanced pupils will be able to appreciate it. The editor has done his work very satisfactorily. The introduction is good, the notes are adequate, and the vocabulary is practically complete.

W. von Hillern, Höher als die Kirche. Edited by C. W. Eastman. x+107 pp. (Ginn.) 1s. 6d.—This is a capital short story, with satisfactory notes, passages for retranslation, and a vocabulary which seems to be complete. We recommend the book as a reader for pupils in the third or fourth year of instruction.

Froschkönig. Von Henny Koch. 36 pp. *Das Märchen vom Dornröschen.* Von Henny Koch. 30 pp. (Blackie.) 4d. each.—Miss Koch is to be congratulated on her skill in dramatising these two fairy tales. Her verse generally runs smoothly, and she has a distinct gift for dramatic work. The scenery suggested is somewhat elaborate; but children have a lively imagination, and may be trusted to enjoy these plays even if the stage is one of Shakespearian simplicity. A few lapses into the old orthography will doubtless be corrected in the second edition.

Vier kleine Lustspiele. By Käte Weber. iv+104 pp. (Arnold.) 1s. 6d.—These plays vary much in interest. The first and second do not appeal to us, as they seem altogether too farcical; the others might do for cursory reading. The introduction of a French lady into the first play is not in the best taste, as she is burlesqued; it will not do our children any good to speak bad German mixed with French, especially when Mademoiselle does not seem to know her own language (she says *une grande honneur* on p. 7). Objection may also be raised to the parody of *Ich hatt' einen Kameraden* on p. 51. We have noticed hardly any misprints; *nun* (p. 13, l. 3) should surely be *uns*. There are no notes, but a vocabulary which is remarkably incomplete.

Bechstein's Märchen. Edited by Frieda Weekley. 48 pp. (Blackie.) 6d.—From Bechstein's many fairy tales six have been selected, and supplied with suitable notes. Although some of the stories are very sad, and even gloomy, the booklet may be recommended for use with pupils in their third year of instruction.

Classics.

Proceedings of the Classical Association, October, 1906. 140 pp. (Murray.) 2s. 6d. net. *The Year's Work in Classical Studies, 1906.* By Various Authors. Edited by Dr. W. H. D. Rouse. xii+140 pp. (Murray.) 2s. 6d. net.—These two volumes taken together give an excellent account of splendid work by the Classical Association in 1906. The most salient features of the former are Prof. Conway's paper on "An Unnoticed Aspect of Virgil's Personality" and the report and discussion on "The Reformed Pronunciation of Latin." The latter, as the first issue of its kind, should attract widespread notice. It presents in every branch of classical study a *résumé* of the progress during the past year written by nineteen specialists. As a year-book it will prove indispensable to teachers and all who wish to keep abreast of modern research. Not only outsiders, but classical students, will be surprised to find in what an amazing degree classical study is at present vital and progressive. The dead languages here prove themselves to be most wonderfully alive. There is an introduction by Prof. Butcher; and the headings of the chapters are: The Teaching of Classics in Schools, Greek Excavation, Italian Excavation, Prehistoric Archaeology, Sculpture and other Arts, Numismatics, Greek Mythology and Religion, Roman Mythology and Religion, Private Antiquities, The Greek Worship, Greek Inscriptions, Latin Inscriptions, Greek History, Roman History, Comparative Philology, Grammar, Textual Criticism and Palaeography, Papyri, Literature, Roman Britain. There is only space here to touch upon a very few interesting points. Besides excavations in Crete and elsewhere, there is the discovery of the shrine of Artemis Orthia at Sparta, where the youths were scourged, followed a month ago by the discovery of the temple of Athena Chalkioikos. Dr. Dörpfeld thinks he has discovered the house of Odusseus. Prof. Furtwängler's "Aegina" has revolutionised our ideas of the pediments of the temple there of the goddess Aphaia (not Athena). Dr. Haerlin has a theory which will change "our whole conception of the earliest money of Rome." The *Lares* are maintained by Wissowa to be deities of the arable land of the farm. A new historian of the first importance has been discovered at Oxyrhynchus for the early fourth century B.C. There are new ideas on Hannibal, Gaius Gracchus, and the Monumentum Ancyranum. Old authors have been "brought to life," the first five satires of Lucilius, and 1,200 lines of Menander.

Taciti Annalium Libri: recognovit breveque adnotatione critica instruxit C. D. Fisher. Scriptorum Classicorum Bibliotheca Oxoniensis. No paging. Cloth, 6s.; paper, 5s.—This book is very welcome. It is possible now, for the first time, to have the Annals in one handy volume, well printed, and with the necessary critical notes. The text, like most of its series, is a sober conservative text based on the best MSS. The basis of this book is, of course, the Medicean MSS., which the editor follows even more closely than his predecessors. In a few places he has left this authority for conjecture or other readings, and he is inclined to think that he has been too free in some fifteen of these, which he enumerates. Two conjectures of his own find places: xi. 23, *perissen satis* for *per se satis* M; xvi. 22, *resupuit* for *respernit* M, *res spernit* Vulgate. It is a scholarly and cautious piece of work, which well deserves a place in this good series.

Anglice Reddenda. Vol. i. Being Latin Extracts for Unseen Translation. Selected by C. S. Jerram. xxiv+120 pp. 2s. 6d. Ditto. Vol. ii. Greek Extracts. xx+213

pp. 3s. (Clarendon Press.)—Jerram's "Anglice Reddenda" is a classic of its kind, and we need say nothing of a book so well known. In this edition the Latin and Greek extracts are published separately.

C. Plini Secundi Epistularum Liber Sextus. Edited by J. D. Duff. xx+94 pp. (Pitt Press.) 2s. 6d.—This edition of the sixth book of Pliny's Letters is preceded by a Life of Pliny and a brief criticism of the Letters, and there are fifty-six pages of notes (to thirty-four of text). For school work the notes are too many, and not altogether judicious. Thus we may cite as examples of injudicious notes the following: "cupio, I am anxious, is much stronger than volo" (p. 64); "posco, begin the clause with 'but' in English" (p. 67); "videmus, we are able to see" (p. 69); "plures, the majority" (p. 67); and so forth. As in most of the modern school books, it would seem that the editor has said to himself, "Go to, let us write notes," and he has done so, without asking what the master really wants to tell his class before they prepare the work. We cannot say that it is a good book from the schoolmaster's standpoint; it does, however, contain a useful assortment of information for those who work by themselves.

Livy: the Second Macedonian War. By W. T. Helmsley and J. Aston. vi+96 pp. Vocabulary. (Blackie's Illustrated Classics.) 1s. 6d.—This book contains extracts from Livy, Books XXXI. to XXXIII., forming a series of sixty short chapters. The style is Livy's, the text not having been simplified to suit beginners (as is done, for example, in Mr. Edwards's "Stories of the Kings"). Each chapter, however, has an English summary prefixed, and the vocabulary at the end shows that the book is meant for beginners. At least, it ought to show this; but in view of the carelessness of editors in such matters, we do not feel confident what these editors did mean. Certainly the boy who can do Livy ought to use a dictionary; special vocabularies are not for him. Editors are learning something, however: the notes are commendably short and business-like. We are still told sometimes that this is a "possessive genitive" or that "partitive genitive," but we have little fault to find with the notes. Some of the translations are misleading (*in parte* tr. "a sharer," p. 45; *et* tr. "when," p. 65). One or two real difficulties are not explained; thus the note on *statim*, ch. x.¹, ought to add that the adjectival adverb must be so placed between connected words as to show its meaning. One note is a puzzle (iii.): "anno 55^{imo}. As the date of the birth of Christ is, through a mistake, not A.D. 1 but B.C. 4, this would be the year B.C. 200." Is A.D. 1, then, not A.D. 1, but B.C. 4?

English.

Archbishop Trench's Select Glossary. By Dr. N. Smythe Palmer. 230 pp. (Routledge.) 2s. 6d.—An addition to the "English Library" issued by this firm of publishers. Dr. Palmer's work has been confined to additional notes, which are enclosed in brackets; but the book in its present form is most interesting and valuable to the student of English.

Shakespeare's (1) Tragedies, 981 pp; (2) Comedies, 848 pp; (3) Histories and Poems, 888 pp. (Dent.) 1s. each net.—Everybody ought to know that this edition of Shakespeare is in the market. It forms part of Messrs. Dent's wonderful "Everyman's Library." Everything is in good taste, and the elegance and cheapness of these volumes ought to recommend them to every section of the reading public.

Scott's Old Mortality. By Hereford B. George. xi+431 pp. (Oxford Press.) 2s.—An excellent edition of what is certainly one of Scott's greatest successes. The novelist's own notes, or all those which are not of merely antiquarian value, appear at the bottom of the pages. The editor appends some of his own.

Goldsmith's Traveller and Deserter Village. xx+84 pp. (Cambridge University Press.) 1s. 6d.—A small volume, but containing in a highly condensed form the results of several years' practical work in dealing with these poems of Goldsmith.

Ivanhoe (1s. 6d.) and *A Tale of Two Cities* (1s. 6d.) are published by Mr. Edward Arnold in his English Literature Series. The books are abridged and edited, and the work is done well. They are a little scholastic in appearance, notwithstanding the pictures: but this may be said of nearly all school books.

A First Book of English Literature (2s. 6d.), by Miss C. L. Thomson (Horace Marshall), is admirable, but it is a pity that we could not have ten times the number of illustrations—they are chosen so well. It is to be doubted if large portions of such books are literature at all, for biography often obscures the issue, and criticism is for the young unintelligible. However, if such books are to be used, and schools will go on using them, no one can prepare them better than Miss Thomson.

AMONG recent additions to Blackie's Red Letter Library are Hazlitt's "Essays," with an introduction by Mr. Charles Whibley; Matthew Arnold's "Poems," with an introduction by Mrs. Meynell; and Burns's "Poems," with an introduction by Mr. Neil Munro. It is difficult to imagine anything more delightful than the printing and binding of these dainty volumes.

MR. WILLIAM HEINEMANN has added to his remarkably cheap series of Favourite Classics "Selected Essays of Joseph Addison," with an introduction by Mr. Austin Dobson, and "Poems of Emily Brontë," with an introduction by Mr. Arthur Symons.

History.

Outlines of European History. By A. J. Grant. xvi+368 pp. (Longmans.) 3s. 6d.—This is a very good book. Teachers who are beginning to foresee that they will soon be expected to teach something of world-history could not do better than take this little book as a first introduction to the subject. They will find in its short bibliographies guidance for the next stage in their reading. Our elder scholars will do well to read it too. It is plentifully illustrated, is clearly and pleasantly written, and it will open their minds to the history of other countries than England and thus help them to understand English history better. In this, as in much else, "what do they know of England, who only England know?" The range of events is from Homer's Greece to the present day. It is divided into three parts, the first hundred pages bringing us down to the adoption of Christianity in the Roman Empire, the second to the "Babylonish Captivity." There is much in the way of thoughtful comment, both expressed and implied, and there are exceedingly few points—and these can easily be corrected in a new edition—which require even small correction. Specially we would express our thanks for the explanatory notes to many of the illustrations.

History of England. By A. D. Innes. xvi+605 pp. (Cambridge University Press.) 4s. 6d., or in three parts 2s. each.—We gather from the preface that this work is

intended for the middle and upper forms of schools, i.e., for pupils between fourteen and eighteen years of age. The author "has not overlooked the demands of examiners and examinations, but he thinks the highest marks are obtained by those who have taken an intelligent interest in the subject for its own sake. The whole history is therefore presented not as a catalogue of events but as a story, a drama." The book fulfils this promise. We have not come across a history of England which we should think would be read with more pleasure by any intelligent schoolboy or girl. The larger space is given to modern times, only a third of the text being devoted to pre-Reformation times. There are no "pictures," but there are more than twenty maps and plans, summaries of constitutions, ecclesiastical, Scottish, Irish, Indian, and colonial matters, genealogical tables, a glossary, a chronological summary, and an index. There are very few points with which we should disagree. The map (p. 46) gives more to France than she possessed in the time of the Plantagenets. Becket was surely not killed "on the altar steps" (p. 51); there are two convocations in this country (p. 89); Barebones' name was only Praise, not Praise-God (p. 282); "ecclesiastical" (p. 285) is surely a misprint for "episcopal" ordination; "occasional" did not have its modern meaning in 1700 (p. 334), but meant "on a definite occasion." Walpole's momentarily successful rival in 1727 was Sir Spencer Compton, not Carteret (pp. 347-8), and he did not say that "every member had his price" (p. 347). The "Asiento" quarrel with Spain was not settled, it is true, in 1748, but two years later, in 1750 (p. 358). Mr. Innes does not seem to have the best information about the diplomacy of the Seven Years' War, and exaggerates the importance of William Pitt in his young days. But these are matters which can easily be rectified, and do not seriously diminish the great usefulness of the book.

Young Folks' History of England. Anonymous. x+107 pp. (Relfe Bros.)—A slight sketch of English history, with tables of kings and dates, and a rhyming summary of each reign. There are some pictures. It is pleasantly written, but omits much, and is at times inaccurate.

A Sketch of Scottish Industrial and Social History in the Eighteenth and Nineteenth Centuries. By A. H. Stirling. ix+225 pp. (Blackie.) 6s. net.—An interesting account of Scottish non-political history since the date of the Union of 1707. It does not go deeply into things and is largely biographical. There are eight portraits and an index.

Readings on English History from Original Sources. Book I. (B.C. 54-A.D. 1154). By R. B. Morgan and E. J. Bailey. vi+134 pp. (Blackie.) 2s.—Not all teachers are of the same opinion as the editors of this book as to the desirability of putting "sources" into the hands of young children, but if the thing is to be done at all, teachers can have no better example of choice of subjects, of pictures, of type, than is contained in this little book. An appendix contains an "analysis of sources" and lists of dates and of "tales illustrative of the period."

MESSRS. MACMILLAN have now published an edition of Green's well-known *Short History* in three volumes, at 3s. each. Each volume is complete in itself, with an index and the maps and other apparatus with which we are all familiar. The dividing dates are 1422 and 1660. This form will appeal equally to the general reader, who likes a book that will go into his pocket, and to the school teacher, whose pupils can have the part required for their "period."

Geography.

The Dominion of Man. By Ernest Protheroe. xii+215 pp. (Methuen.) 2s.—This is a good readable book, written in an easy, swinging style by an author who is evidently no believer in dry-as-dust methods or statistical disquisitions. The pity of it is that "inaccuracies"—to put it gently—have been allowed to creep in here and there to such an extent that the student must be ever on his guard, and "verify his references" on almost every page. We shall allude to some of these inaccuracies shortly. The headings of chapters give a clue to the method of treatment: "Climate and Man's Environment," "Man and his Raw Materials," "Man and his Roads," "Man and his Markets" are samples; this is the true view of commercial geography—indeed, of all geography—as a description of the earth as the home of man. To enhance his description the author inserts some thirty or forty speaking pictures, all good and clear, and several excellent, notably one of a wheat elevator (p. 44), which is quite the best we remember to have seen. Up-to-dateness is guaranteed in the inclusion of such events as the opening of the Simplon Tunnel, the extension of the Rhodesian Railway to Broken Hill, and the temporary ruin of San Francisco. A short appendix of three pages provides a few needful statistics. But, as we have said, the reader must be very careful in taking everything that Mr. Protheroe states as absolutely accurate. Otherwise he will flounder once more in the antique waters of the Gulf Stream myth (p. 10); he will learn that Portland cement is made from Portland stone (p. 94), and that there is practically no kaolin outside of Cornwall and Devon (p. 94); he will read of Hindoos (p. 34) and the Congo Free State (p. 32), of Quebec as the capital of Canada (p. 200), and Asaba (p. 201) as the capital of Nigeria (*sic*); he will infer that it is only a serious competition with, and not a virtual annihilation of, madder and cochineal, and one can almost say indigo, that has followed the introduction of chemical dyes (p. 79); he will lose all signs of Liège as a factory of war material in the section devoted to the subject (p. 110); and, finally, he will imagine that Sir Titus Salt is still alive (p. 157), that the Union and Central are two railways in North America (p. 123), and that the famous Albara Bridge contract (on which Mr. Protheroe should really consult the editor of "Commercial Intelligence") was actually what it claimed to be, viz., a triumph for American over British firms (p. 168). From all of which it is obvious that we recommend this book to none but careful and conscientious students. To them it will be interesting enough.

Wall Map: Asia. Orographical. Compiled under the direction of H. J. Mackinder. (Stanford.) Sheets, 16s.; mounted, 20s. Size, 60 in. x 52 in.—This new orographical map merits nothing but praise, and is a fitting successor to the three already published in the same series, viz., Europe, Africa, Palestine. As it includes the whole of Europe, the essential unity of "Eurasia" is seen at a glance—a most important point to make in the teaching of Asia. The scheme of colour is simple, but withal effective—browns for land elevations, blues for sea depths. Political frontiers are indicated by grey lines, and the same "invisible" colour is selected for the lettering. The map, therefore, practically serves the purpose of a test for the Form as well as a base for working up the school atlas. Incidentally, we do not care for the spelling of Indian names adopted; but this is a secondary consideration, and does not detract from the value of the map for class work. The "statement" sent out by the publisher

with the map is valuable in itself; it furnishes an epitome of Asia's physical geography, and in the hands of a good teacher would effect more than many a text-book. It enumerates twenty-two points—all good and all necessary to a right understanding of the continent. Here are three taken at haphazard for the sake of example: "No. 1, The plateau of Tibet and the Pamirs"; "No. 7, The Ural range dividing the great lowland into two nearly equal parts, and extending, with a bend like the blade of a sickle, through Nova Zembla" (excellently shown on the map); "No. 17, The shallowness of Palk Strait." Our advice to teachers of geography is: "Write for this wall-map at once."

Mathematics.

A School Course of Mathematics. By David Mair. viii+379 pp. (Clarendon Press.) 3s. 6d.—When a school book appears which is written on entirely new lines it is not by any means easy to decide in every case whether the new departure is justified; the difficulty becomes all the greater when the new methods affect nearly all the work of a school in a fairly well-defined department like that of mathematics. The range of this book is said to be "in general agreement with the practice of our schools; containing the Geometry, Algebra and Trigonometry usually read by pupils that do not specialise in mathematics. In detail there are a few differences." The order and method of treatment are, however, very different. Much of the discussion seems to us to be excellent, well suited to the beginner, and very stimulating to teacher and pupil alike. The prominence given to solids in the treatment of geometry is specially noticeable; the references to various practical problems, such as those on pp. 108-121, though possibly not wholly intelligible to the average pupil, are yet very valuable as bringing geometry into connection with the work of everyday life. How far the book could be adopted as a working text-book must be left for the decision of actual trial. That the teacher will find it worth careful study we are quite convinced; that it will form a standard for the new text-book of school mathematics does not seem to us to be so certain.

Elementary Mathematics. Algebra and Geometry. By Alex. Leighton. viii+296 pp. (Blackie.) 2s.—The range of this text-book is roughly: algebra up to and including quadratic equations in one unknown quantity; geometry, the subject-matter of Euclid's first three books, together with the simpler properties of similar figures and the mensuration of the simpler solids. In the treatment of algebra free use is made of graphical illustrations, equations are introduced at an early stage, and the examples for practice are numerous and free from complications. The greater part of the book is given to geometry, and full use is made of drawing as leading up to the theoretical discussions; the various references to solids and the introduction of mensuration of simple solids are distinctly valuable. The treatment as a whole is good, and the book is well suited for beginners.

A First Geometry. By W. M. Baker and A. A. Bourne. viii+128+ (Answers) vi pp. (Bell.) 1s. 6d.—Except for a short course of "Theorems," pp. 109-128, the treatment of geometry is carried out on the lines of what is usually called "experimental" or "practical" geometry. The course seems to be well adapted for beginners; the exercises are simple, but bring in a large number of essential geometrical properties, and the applications of drawing to scale are of a kind that should be known to pupils, whether the pupils are interested in them or not.

The preface sounds a warning note, that is certainly not altogether to be disregarded, respecting the tendency to substitute geometrical drawing for calculation.

Pitman's "Proficiency" Arithmetics. Part i., 35 pp.; part ii., 39 pp. Paper, 2d.; cloth, 3d. each. Answers to part ii., 8 pp., cloth, 3d. net. (Pitman.)—Part i. treats of simple quantities: addition, subtraction, multiplication, and division. Part ii. forms an extension of the work of part i., and also deals with compound quantities, the questions involving only small sums of money. The books are designed to meet the requirements of Schedule VI. of the Code of 1906.

Introduction to the Theory of Fourier's Series and Integrals and the Mathematical Theory of the Conduction of Heat. By H. S. Carslaw. xvii+434 pp. (Macmillan.) 14s. net.—Of all the applications of higher mathematics there is probably none that is more instructive to the student or that has reacted more powerfully on pure mathematics than the investigations inaugurated by Fourier on the conduction of heat. The marvellous combination of mathematical power, physical insight, and expository skill presented by Fourier's treatise has won for it a secure place among the classics of pure and applied mathematics, and makes its study even now almost indispensable. At the same time, it must not be forgotten that new standards of mathematical rigour have been set up that make it necessary for present-day students to approach the subject in a somewhat different way from that adopted by Fourier. The treatise now under notice is written from the modern standpoint, and is an admirable guide to the subject for the well-prepared mathematical reader. A considerable number of the earlier pages deals with purely mathematical considerations that are undoubtedly important, but might perhaps have been compressed into smaller compass; the first four chapters, though they contain much good mathematics, may give the physicist a false idea of the real nature of the book. The discussion of the Fourier series and integrals is very clear, is well illustrated by simple examples and graphs, and contains all that is required for physical applications. Part ii. of the book, forming pp. 191-410, treats of the mathematical theory of the conduction of heat in solids. The problems that may be called classical are discussed in a way that satisfies modern demands from the mathematical standpoint, and are illustrated, where opportunity offers, by accounts of experimental methods based on the mathematical analysis. Recent developments, such as the applications of Green's functions and the use of sources and sinks, are fully dealt with. Two appendices on the bibliography of the subject will be highly valued by students; it is gratifying to learn that the various journals referred to are accessible in the library of a colonial university. The book is furnished with a full table of contents and a good index that make it suitable for purposes of reference.

Science and Technology.

A First-year Course of Practical Magnetism and Electricity. By P. E. Shaw. 66 pp. (Electrician Publishing Co.) 2s. 6d. net.—In this volume a short course of thirty-five experiments is presented, distributed over a wide range of subjects, commencing with the measurement of length and terminating with wireless telegraphy and electric motors. The preface states that "the many small books on elementary practical physics all assume in the student a knowledge of the rudiments of algebra, geometry, trigonometry, and mechanics. There is, however, a large and

growing class of technical students who have not even this primitive mathematical training, and who cannot, or will not, acquire it as a foundation for physical science.... In this book, I have sought to make the experimental work as quantitative as possible, yet to avoid mathematical symbols." The sentiments here expressed are not, in our opinion, in agreement with modern notions of true education. A foundation of mathematics is necessary to the student of magnetism and electricity; therefore it should be encouraged. In this volume we do not seek in vain for mathematical symbols; for, in Exercise 9, we read that "The magnetic moment is given by the law

$$M = \frac{H \cdot d^3}{2} \cdot \tan A,$$

and "tan A is given by reference to a book of logarithms." Similar quotations might be given from other parts of the volume.

Examples in the Mathematical Theory of Electricity and Magnetism. Edited by J. G. Leathem. 59 pp. (Arnold.) 1s. 6d.—A collection of 205 examples, taken chiefly from papers set in the Cambridge tripos examination and in college examinations of the same university. The mathematics involved is necessarily of an advanced order.

Elementary Science, for the Preliminary Certificate Examination. Section B, Physics. By J. Satterly. 248 pp. (Clive.) 2s.—This book has been specially prepared to meet the requirements of one of the syllabuses in Elementary Science of the Preliminary Examination for the Teacher's Certificate. If we disregard the special purpose for which the book has been written, we have no hesitation in recommending it as a trustworthy guide to the student. But an important consideration is the preponderance of girl students amongst the candidates for the Preliminary Certificate Examination, and many of these are totally devoid of mathematical training. Such candidates would find insuperable difficulties in following certain portions of the book, especially those dealing with mechanics and heat. This criticism would not apply, of course, in the case of pupil teachers who are taking mathematics as an optional subject. The sections on magnetism and on electricity are decidedly elementary, and are sufficient for the purposes of the examination.

Applied Electricity. By J. Paley Yorke. 420 pp. (Arnold.) 7s. 6d.—This book is intended as a text-book of electrical engineering for second-year students who have already become acquainted with the fundamental principles of magnetism and electricity, and have also a knowledge of the elements of mechanics, heat, and mathematics. Only those sections of pure science which are connected with modern electrical practice are dealt with; and these sections include chapters on units, measurement of current, E.M.F., resistance, and on magnetism. The remainder of the volume is devoted to the principles of incandescent and arc lighting, electric installations and power distribution, dynamos, continuous-current motors, alternating currents and transformers, &c. The subject is treated in a satisfactory manner, and the volume is well illustrated and printed. It will serve well as an introduction to the more specialised branches of electrical engineering.

The Science of Common Life. By J. B. Coppock. vi+273 pp. (Sonnenschein.) 3s. 6d.—This course of experimental physics and chemistry presents no very novel features. The instructions for practical work are concise and adequate, and the running commentary of theory is

trustworthy. Students preparing for the Board of Education examination on "The Science of Common Life" will find it useful.

Physics—Theoretical and Descriptive. By H. C. Cheston, J. S. Gibson, and C. E. Zimmerman. 373 pp. (Heath.) 3s. 6d.—This volume has been prepared as a text-book for the use of students in American high schools, and it is intended to convey a knowledge of the theoretical and descriptive, as distinct from the quantitative, aspects of the subject. All branches of physics are included, and these are treated in an interesting and up-to-date manner. The chief criticism which we would offer is that the various branches are not treated with corresponding fulness; thus, static electricity is confined to three pages of the text, while sixteen pages are devoted to an excellent chapter on Dispersion of Light, and Colour. The illustrations are excellent.

Exercises in Physics for the Use of Schools. By J. H. Leonard and W. H. Salmon. 116 pp. (Murray.) 1s.—These exercises have been drawn up at the suggestion of several science teachers, who desired to have a series of examples from which home work or class work may be set. The examples are simple, varied, and well chosen, and they can be recommended for use in secondary schools and evening technical schools.

MISCELLANEOUS.

Kings in Babylon. A Drama. By A. M. Buckton. 72 pp. (Methuen.) 1s. net.—Miss Buckton's "Eager Heart" has become almost a classic in its way, and is certainly the most successful attempt we have seen to revive the mediæval mystery-play. This drama of Nebuchadnessar (or, as it seems we ought to say, Nabu-kudurri-uzzur) and the Three Holy Children is more ambitious and not quite so successful. There is certainly room for a renaissance of the religious drama; and no one could be more fitted than Miss Buckton for the task. She unites a strong sense of stage effect with deep religious feeling and a dignified simplicity of style. For the purpose in view, these qualities are more requisite than a feeling for character, which hitherto it has not been in her scheme to display. Here we have, first, the picture of the captive Jews planning their release from captivity on the ordinary lines of conspiracy. Next there is the scene in which the King, Nebuchadnessar, insists on all his subjects, Jew and Gentile alike, bowing down to the image of Bel that he has set up. The three faithful Jews are cast into the furnace in which the gold for the idol had been molten, and the King confesses himself

"a beast before you all—

A dull ox driven out to the hills!"

Miss Buckton has carefully studied the latest investigations of scholars upon the Bible story, and has made—so far as we can judge—a true rehabilitation of Babylon and its ruler. We think she is well advised in forsaking any attempt to reproduce the naïveté of the early miracle plays, and in being frankly modern in her outlook, while she retains the essence of the tradition, namely, the reverent spirit which alone makes such work profitable and edifying.

St. Agnes and other Dramas. By E. G. Harris. 179 pp. (Dent.)—The best that we can say of these plays is that they are well-intentioned; and this is not such faint praise as may appear. For we are not yet beyond the need of lifting the drama from the ruts into which it has fallen, of mere frivolity, or mere excitement and

appeal to the senses. There is room for serious plays of all sorts. These stories of martyrs in dialogue form may evoke interest in serious subjects if presented, as the author seems to have planned, before private societies, such as the Guild of St. Agnes (whatever that may be!) and other agencies for the mental and moral improvement of young men and women. The plays are partly in verse (of the blankest), and they are interspersed with songs and hymns. The fault we have to find with them, apart from the poverty of their execution, is that stories of martyrdom are essentially non-dramatic. The martyr, *qua* martyr, is one who conquers apparently without effort—though actually, of course, by means of faith—the natural shrinking of the human spirit from pain and death. Such figures are too far removed from normal experience to enter into dramatic situations, which must consist of a struggle or contrast between normal human emotions. As an example of fortitude and noble heroism, St. Agnes is admirably fitted to be brought before the notice of the young. But, although Miss Harris shows some sense of dramatic presentation, she is heavily handicapped by her subject, and can only make of it a spectacle rather than a play.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Epidemics in Day Schools.

"HEADMASTER" has been unusually unfortunate in his experience, and he has shown a lamentable lack of knowledge for his position of "headmaster"; one would have thought that anyone assuming such a position would have known of the "Code of Rules for the prevention of Infectious and Contagious Diseases in Schools," issued by the Medical Officers of Schools Association, which would have at once given him the information he required in the most up-to-date form.

No medical man has in his own practice sufficient data to form a trustworthy opinion as to the incidence of infectious diseases, and can only express the results obtained from the experience of many workers, collated and digested by competent observers, such as the "Code" above referred to, which—although later observations may necessitate corrections and alterations—may be regarded as the expression of the latest available information, and which he might just as well consult himself as refer to a medical practitioner, who can only echo the information there published; to medical science, therefore, must not be attributed the lack of credibility with which he charges it.

As regards the second point raised by "Headmaster," i.e., the question of a pupil who already has had an infectious illness coming to school from a house where the disease exists. I fear he is also showing a very limited application of the "common sense" which he considers so urgently needed on the question: all the infectious diseases he mentions are more or less "protective," that is to say, that the body invaded by such an infection develops a counteracting medium to the infection, and a struggle for the survival of the fittest results; if the invading organisms overcome the counteracting forces the patient dies, and if the counteracting forces overcome the invading organisms the patient not only recovers, but as a rule retains in the body some of

this counteracting material, so that any future invasion by a similar organism is at once repelled. There are, however, many persons in whom this counteracting material does not persist, or persists in such small amount, that it is insufficient to repel a second invasion, and then the patient may suffer a second time from the same illness. This is the generally accepted view by the medical profession at the present time—*pace* the “nearly every authority” referred to by “Headmaster”!

These being the facts, the practical application of them seems fairly clear and definite from the scientific standpoint. Thus :

(1) No child should be allowed to return to school until after the expiration of the incubation period since the last exposure to any infectious illness.

(2) In ordinary houses isolation is practically impossible, and therefore the “last exposure” should count from the last date of the infectious period of the patient.

(3) Where a pupil has already had an infectious illness and is again exposed to it there is a great probability that it will not again infect him, and therefore he may be allowed to return to school; but, bearing in mind the possibility of his having a second attack, his temperature should be taken night and morning during the incubation period, and he should not be allowed to return to school if there is any rise of temperature or he has any indisposition of any kind whatever (where there is any doubt as to this being efficiently done he should not be readmitted to school until the incubation period has passed, the safety of many requiring the sacrifice of the few).

(4) Where a pupil has already had an infectious illness and is living in the house where such illness occurs, there is little risk of his carrying the infection (with the exception of scarlet fever) provided he is rigidly prevented from in any way coming in contact with the case, and he may, subject to (3), be allowed to attend school.

(5) Where a school is so full of infection that cases are constantly occurring, there is no object in excluding individual pupils, and other methods must be considered for stopping such an epidemic.

The policy of open windows and other hygienic measures advocated by “Headmaster” is, of course, useful, for there is less illness where the sanitary arrangements are most efficiently carried out; but surely he cannot think, with society constituted as it is, that such a Utopian result as he suggests can possibly occur during the time of his headmastership. Would it not therefore be better for him—and for us all—to adopt a really “common-sense” plan of action, recognise that infectious disease *must* occur, have rules such as I have suggested, to meet it when it does occur, and avoid on the one hand getting into a panic, and on the other hand a reckless exposure of the unprotected—for mild as these diseases usually are, measles and whooping-cough still head the list of the causes of death in our islands? M.D.

Proof of the Parallel Theorem.

ONE of the arguments used against the order of theorems adopted in the Cambridge syllabus is that the sequence demands that the fundamental theorem on parallels shall be proved from first principles. This renders the proof very difficult for beginners. The objection holds against the proof given in Barnard and Child’s “New Geometries,” and, personally, for the last couple of years I have used the proof below. I should be much obliged if room could be found in THE SCHOOL WORLD for this letter and the proof in question, so that readers, especially those who use these text-books, might express their opinions on

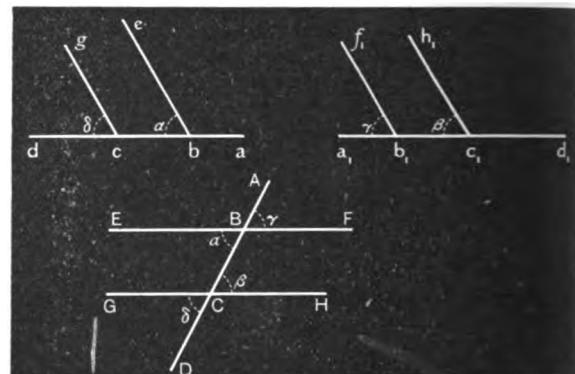
the comparative merits of the two proofs from the practical teacher’s point of view, either in these columns or privately to me.

J. M. CHILD.

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Theorem.

If a straight line fall across two other straight lines so as to make the alternate angles equal, the two straight lines are parallel.



Let ABCD fall across the two straight lines EF, GH, so as to make the alternate angles α , β equal to one another : then

EF is parallel to GH.

Proof.

Since $\alpha = \beta$,

and $\therefore \alpha = \gamma, \beta = \delta$

[Hyp.]

$\therefore \gamma = \delta$.

[Th. 3]

Let the figures $dcgbea$, $a_1b_1f_1c_1h_1d_1$ be congruent respectively with $DCGBEA$, $ABFCHD$; then

$\therefore \angle dcg = \delta = \gamma = \angle a_1b_1f_1$

and $\angle cbe = \alpha = \beta = \angle b_1c_1h_1$,

and $cb = CB = c_1b_1$;

\therefore the figure $dcgbea$ can be placed upon the figure $a_1b_1f_1c_1h_1d_1$, so that c falls on b_1 , and b on c_1 , and the lines da , cg , be lie along the lines a_1d_1 , b_1f_1 , c_1h_1 .

Hence, if the lines GH, EF are supposed to meet in the direction of H, F,

i.e., CH, BF meet in the direction of H, F

$\therefore c_1h_1, b_1f_1$ ” ” h_1, f_1

$\therefore be, cg$ ” ” e, g

$\therefore BE, CG$ ” ” E, G

i.e., the lines FE, GH meet in the direction of E, G, as well as in the direction of H, F : but two lines cannot intersect in two points ;

\therefore EF, GH do not meet at all.

$\therefore EF \parallel GH$.

In teaching with the blackboard, the auxiliary congruent figures are constructed with dotted circular arcs. As this takes a little time, the students are generally prepared for the method of the proof by the time the figure is finished ; and the proof is understood far more readily than if the part ABFCHD (or its trace) is swung round in one operation to coincide with the part DCGBEA.

A Table Appliance for Measuring Electric Currents.

THE apparatus here described has proved itself useful as a means of rapidly regulating a current to any required dimension within a range of considerable extent, and of measuring its voltage and amperage, without encumbering a lecture-table with the resistance boxes, voltmeters, ammeters, &c., usually required. A lecturer, moreover, after performing one experiment for which a small current

only was required, may perhaps wish to turn to one needing a far heavier current. This would in most circumstances necessitate changing the resistances previously used for others of greater carrying capacity, and perhaps changing his ammeters and voltmeters also. To avoid this inconvenience and loss of time, I use for my lectures

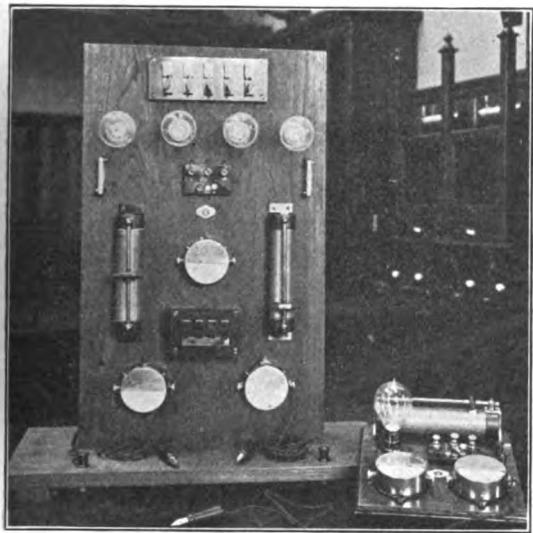


FIG. 1.

here a vertical teak board measuring about 2 ft. by 1 ft. 6 in., fitted as shown in Fig. 1.

The connections are shown diagrammatically in Fig. 2. It is obvious that the fittings would need certain modifications to suit different ranges of voltage. The fittings described are suitable for voltages 1-50.

T₁, where current enters from battery or generator.

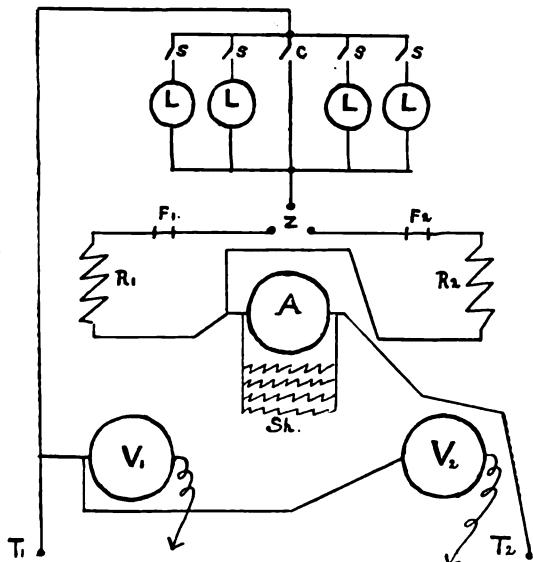


FIG. 2.

L, L, L, L, four 50-volt lamps in parallel, giving resistances about 80, 40, 26, 20 ohms, and carrying current up to about 2½ amperes.

S, S, S, S, lamp switches.

C, lamp cut-out switch, used when heavier current is needed or small voltage is employed.

Z, a two-way switch.

From Z the current can be diverted to the left through a 10-ampere fuse, F₁, and thence to the rheostat, R₁, of resistance 8 ohms, capacity 10 amperes, or from Z the current can be diverted to the right through a 1-ampere fuse, F₂, and the rheostat, R₂. This has resistance up to 32 ohms, capacity 1 ampere. By either course the current reaches the ammeter A. This is a small instrument with a 3-in. dial, and graduated to 2 amperes only. Thus an "open face" is secured, and small currents can be measured with some accuracy. Sh. is a shunt box, with $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ shunts, so that a 10-ampere current can be employed if needed.

T₂, terminal for attachment to lecture apparatus.

V₁ is a voltmeter reading 1-50 volts.

V₂, a voltmeter reading 1-6 volts.

The negative terminal of each voltmeter consists of some 2 ft. of flexible wire ending in a "dagger point." By employing these flexible terminals, not only can the voltage of the supply battery be read, but also the volts consumed in any portion of the circuit, and the accuracy of many experiments involving numerical results readily checked.

Several smaller modifications of the above are used at this school by the senior students. Fig. 3 shows a board in which the instruments are made to be used in a horizontal position.

These boards have proved particularly useful for checking results obtained by the usual methods, such as:

(1) Resistance of a wire or of any portion of a circuit. By the free voltmeter terminal we can measure E₁ at either end of the wire; note ammeter reading then

$$R = \frac{E_1 - E_2}{C}$$

(2) Thermal effects of current and Joule's law. Read E₁, E₂ at each end of wire passing through the calorimeter. Take ammeter reading, and check value obtained by thermometer for heat produced by formula $H = \frac{CEt}{4.2}$.

(3) The carrying capacity being high on one side of the board and the current capable of very minute adjustment on the other, the same board serves for regulating the heavy current needed for, say, the action of currents on currents, and the very small one for mirror galvanometer, &c.

By connecting the terminals direct to a battery, varying the resistances in circuit, and taking reading by connecting the voltmeter terminals to various points, a student in a short time gets clear ideas of these effects in the following:

(1) Variation of volts consumed with resistance encountered.

(2) Different effects of resistance in series and parallel.

(3) Importance of internal resistance when external resistance is small, and its converse.

(4) Use of shunts.

(5) Ohm's law true for any part of a circuit.

(6) Use of fuses in short circuit, &c.

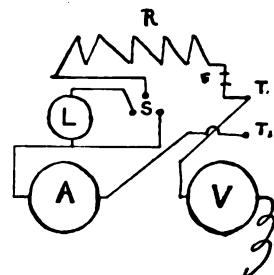


FIG. 3.—T, T, terminals; R, rheostat, 1 amp. capacity, 32 ohm resistance; S, two-way switch; L, lamp, 80 ohm resistance; A, ammeter, 1-2 amps.; V, voltmeter with free terminal; F, 1 amp. fuse.

Moreover, by habitually using the board, except in such cases where it is not desirable that he should be able to measure current or voltage direct, a pupil gains some definite notion of what a current of, say, 1 ampere means, or at least he gets to know what strength of current is needed to use with different apparatus; probably most boys who work successfully the ordinary experiments given in a laboratory course have no notion of the magnitude of the current they are using. By their attention being constantly directed to the readings on the instrument, the terms volts and amperes cease to be mere words.

W. E. CROSS.

Whitgift Grammar School, Croydon.

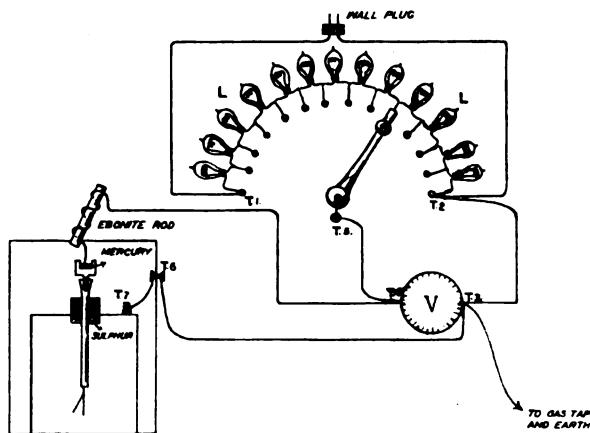
Quantitative Experiments in Electrostatics

EXPERIMENT I.—To obtain the voltage-curve of an electro-scope.

The electroscope has a single gold leaf, which is observed through a microscope having a scale in the eye-piece. Instead of the usual "cap," a small mercury cup (made out of a terminal) is screwed on to the brass rod carrying the leaf. A "Faraday-cage" or "screening-box," i.e., a wooden box lined with tinfoil or zinc and earth-connected, protects the instrument from electrostatic disturbances.

By the voltage-curve is here meant a curve drawn with the microscope-readings represented along the axis of abscissæ, and the corresponding voltages of the gold leaf along the axis of ordinates.

The connections for a calibration are shown in the diagram. The terminals T_1 and T_2 of a "potential-



divider" or "volt-box," consisting of ten or fifteen 16-c.p., 230 volt lamps in series, L, L, are connected to the supply mains. One terminal, T₃, of a voltmeter is connected to the earthed end, T₂, of the lamps; the second terminal, T₄, of the voltmeter is connected to one end, T₅, of a metal lever, the other end, C, of which can be made to press on any of the pieces of metal, D, D, in metallic communication with the lamps. The terminals T₆ and T₇ of the electroscope case and screening-box are connected to the earthed terminal T₃ of the voltmeter, while terminal T₈ is connected to an insulated wire W wound round an ebonite rod and dipping in the mercury cup of the electroscope.

In this way a number of voltages, from 0 up to the supply-pressure, can be applied to the electroscope and their values read off on the voltmeter, provided the latter has a resistance which is sufficiently high compared with that of the lamps.

For each position of the lever—starting with the one that gives the highest readable deflection of the leaf—the wire W is allowed to remain in the mercury for some seconds so as to ensure that the leaf acquires the potential of the wire. The voltmeter-reading is taken just before removing the wire from the mercury, and the microscope is read just after (the microscope-reading is, of course, higher while the wire is in the mercury).

EXPERIMENT 2.—To determine the electric capacity of the electroscope calibrated in the previous experiment.

The leaf is charged to the highest possible reading. A small brass ball, held by means of a silk fibre, is allowed to touch the drop of mercury in the electroscope terminal, removed and discharged, and a reading of the microscope is again taken. These operations are repeated as long as contact with the ball produces an appreciable diminution in the reading.

If C' be calculated separately from (1), (2)..., and (n), the results are liable to differ greatly from one another. If, however, the average of these be taken, it will be found to agree very well with formula (A). In practice the latter formula is used, as the calculation is then much simplified.

EXPERIMENT 3.—To measure a capacity of the order of 1 cm.

The capacity of a small electroscope having been determined as well as its voltage-curve, other small capacities can now be compared with the electroscope in the same way as its capacity was compared with that of a ball of known radius.

Technical School Southend-on-Sea

The Choice of School Text-books

NOT the least of the many difficulties that beset a school-master is the choice of books for use in the various classes of his school. However much trouble is taken, one always feels that the right edition may have been overlooked. The claims of economy, too, have to be considered as well as the demands of the specialist teacher. The choice is particularly difficult in top forms in, for instance, history or geography, when a book is needed that includes all the ground already covered in other forms, though studied bit by bit during previous years.

In the hope that space enough can be found for its

publication, I offer a tentative list, prepared for use in this school next term, as the basis of discussion and comparison. We are aware of our shortcomings, and would like to be able to amend our choice by the experience of our brothers. For our hope is that other headmasters and headmistresses will send their own lists to THE SCHOOL WORLD, so that it may perhaps prove possible to compile from the various lists a summary of the books most usually adopted.

G. H. CLARKE.

The County School, Acton.

ACTON COUNTY SCHOOL.

Books proposed for use in the Summer Term of 1907.

The school was opened in April, 1906, and is intended for boys up to the age of eighteen or nineteen. At present about 190 boys are divided into seven forms; the average age of the lowest form is eleven years four months, and that of the top fourteen years ten months. The standard, as yet, is low. Books are supplied by the school.

Scripture.—“Lessons from the Old Testament,” Junior Course, Glazebrook (Rivingtons); The New Testament, A.V.; “A Concise Bible Dictionary” (Cambridge Press).

English Literature and Grammar.—Form II., “English Poetry for the Young” (Blackie); “Home and Abroad Reader,” pt. iv. (Arnold); “Grammar,” Davidson and Alcock (Allman).—III. Lr., Poetry as above; “Britannia Reader,” IIIA. (Arnold); “Grammar,” Hyde, section ii. (Heath) (used also in the four following forms).—III. Md., “John Gilpin” (Blackie); “Tom Brown’s Schooldays” (Nelson).—III. Up., “Ballads of British History,” pt. ii. (Nelson); “Heroes of Asgard” (Macmillan).—IV. Lr., “Marmion,” Canto vi. (Nelson); “Ulysses,” Lamb (Blackie).—IV. Up., Spenser, Selections (Blackie); “Life of Nelson,” Southee (Nelson).—V., Chaucer, “Prologue” (Clarendon Press); “Montezuma,” Prescott (Blackie); “Manual of English Grammar,” Nesfield (Macmillan); “English Literature,” Wilson (Arnold).

History.—Form II., “Britannia Reader,” IIIA. (Arnold).—III. Lr., “Oxford Manual,” pt. i. (Blackie).—III. Md. and III. Up., “Elementary History,” Ransome (Rivingtons).—IV. Lr. and Up. and V., “English History,” Oman, pts. ii. and iii. (Arnold).

Geography.—Form II., “London, Historical and Descriptive” (Blackie); “England and Wales,” Lyde (Black).—III. Lr., “Concentric Geography” (McDougall); “Our Island Home,” pt. ii., Mackinder (Philip).—III. Md., “Europe,” Lyde (Black).—III. Up., IV. Lr., and IV. Up., Lyde’s Series (Black).—V., “Man and His Work,” Herbertson (Black); “Atlas,” L’Estrange (Philip).

Latin.—Set 3. Bell’s “Concise Latin Course.”—2. “Latin Course,” pt. i., Scott and Jones (Blackie); “Scalae Primae” (Bell).—1. “Prose,” North and Hillard (Rivingtons); “Scalae Mediae” (Bell); Kennedy’s (Smaller) Primer (Longmans).

French.—Form II. and Set 6. “Preparatory French Course” (McDougall).—5. Mackay and Curtis, pt. i. (Whittaker); “Les deux Brigands” (Hachette).—4. Mackay and Curtis, pt. i.; “Nouvelles et Anecdotes” (Rivingtons).—3. Mackay and Curtis, pt. i.; “La jeune Hardie” (Rivingtons).—2. Mackay and Curtis, pt. ii.; “Elementary Accidence” (Brown and Sons); “Le petit Tailleur Bouton” (Rivingtons).—1. “French Composition,” Grandgent (Heath); “Elementary Accidence”; “Waterloo,” Houssaye (Black); “Extracts in Phonetic Transcription” (Black).

German.—Set 3. “Lehrbuch,” Spanhoofd (Heath); “Deutsches Allerlei” (Rivingtons).—2. “Lehrbuch,”

Spanhoofd; “Lustige Geschichten.”—1. “Lehrbuch,” Spanhoofd; “German Conversation and Composition,” Wesselhoeft (Heath); “Fritz auf dem Lande” (Rivingtons).

Mathematics.—*Geometry*, Baker and Bourne (Bell).—*Algebra*, Baker and Bourne (Bell).—*Arithmetic*, Examples, Pendlebury (Bell); “A Junior Arithmetic,” Pendlebury and Robinson (Bell).—*Trigonometry*, Lock (Macmillan).

Science.—*Nature-study*, “The Book of Nature”; “Nature Study,” Latter (Dent); “Chemistry for Schools of Science,” Parrish (Macmillan); “Heat, Light, and Sound,” Jones (Macmillan); “Inorganic Chemistry,” Newth (Longmans); “Electricity and Magnetism,” Sander-son (Macmillan).

[Other headmasters and headmistresses have experienced the difficulty of which Mr. Clarke writes. To render assistance in such cases we shall be glad to receive similar lists of books in use in well-known schools, and will endeavour to publish a digest of them in an early issue.—Eds.]

School Sermons.

THE last twenty years have seen an awakening of public interest in educational matters generally; but, strangely enough, the parent who is ready to suggest what should and what should not be taught, and the strength of whose opinions about the secular teaching varies, in general, directly as his ignorance—this parent rarely makes a suggestion about the subject of which he probably has some knowledge, viz., religious and moral teaching. Perhaps it is in consequence of this that in one particular, a most important particular, the system of fifty years ago is still in vogue. School sermons might be made a most powerful engine for forming character and instilling moral ideas; they are too often but a waste of time for the preacher and a dreary period of boredom for the congregation. I am now speaking, not so much of the big public schools, though even there the comparatively small proportion of clerical masters in these days makes the question important, as of the numberless small schools scattered over the country, of one hundred to one hundred and fifty boys. In these perhaps the headmaster alone is in orders, and, with the exception of a few schools, he alone preaches. The results would be unsatisfactory enough if he contented himself with preaching sermons of his own twice a term and read a good selection of other men’s sermons on the other Sundays; but when, as is sometimes the case, he preaches nothing but his own sermons, the loss of opportunities is truly appalling.

The figure of the conscientious headmaster who feels that he has something new to tell his boys each week, and laboriously writes his discourse when he should be resting, is a truly pathetic one—fortunate indeed if he is blind to the inattention and listlessness of the great majority of his audience. After a very few years his style and delivery become stereotyped. Equally stereotyped, likewise, though he is unconscious of it, become his treatment of a subject and method of presenting it. No one likes to point out these facts to him; no one hints to him that his boys get tired of hearing the same voice, the same inflections, the same truths presented to them in the same form of words and with the same outlook Sunday after Sunday; no one has the hardihood to suggest that, though he may believe he has something new to say each week, there is also the boys’ side of the question, and that they may not be willing to listen to him. Surely those masters, at all events, who can be trusted to give Divinity lessons could

also be trusted to preach their own sermons (if they wished to), while the others could read those of such headmasters as Dr. Arnold, Dr. Temple, and Mr. Almond. Then the headmaster's biterminal sermons would be a novelty, and would receive the attention they merit.

Truly the author of "Tom Brown" has much to answer for with his "The tall gallant form, the kindling eye, the voice now soft as the low notes of a flute, now stirring as the call of the light infantry bugle who stood there Sunday after Sunday . . ."; but then, no doubt, Dr. Arnold was unique.

LAYMAN.

Pessimism in Education.

In the March number of *THE SCHOOL WORLD* I observe that Prof. Armstrong takes a somewhat different view of some great men from that generally adopted. "Would not boys and girls tell us," he inquires (p. 82b), "that Macaulay's essays on bores like Warren Hastings and Frederick the Great had little interest for them—being for the most part beyond their comprehension?" Prof. Armstrong's pronouncements have been subjected to a pretty bit of Socratic cross-questioning by Dr. Rouse, from a literary-pedagogical point of view, in your April number. Far be it from me to attempt anything of the sort from a historical-pedagogical point of view: recent experience has shown how easily a humble trawler may suffer if its peaceful fishing-grounds happen to lie near the lordly track of a big man-of-war. Still, I should be glad to know—and many history-teacher readers of *THE SCHOOL WORLD* might be glad to know too—whether it is Prof. Armstrong or Prof. Armstrong's schoolboy that regards Hastings and Frederick as "bores": whether these bores are "for the most part beyond the comprehension" of schoolboys because of their own qualities or merely because of Macaulay's method of treating them; how that "innate desire for a closer knowledge of actual fact" which seems to animate Prof. Armstrong's schoolboy is going to be satisfied, as regards the "actual" political "facts" of to-day, without a deal of knowledge of these same "bores"? Perhaps, before formally and finally labelling Frederick the Great *Poison*, Prof. Armstrong would have the goodness to read the certificate of that eminent analyst, Lord Acton, to the effect that the said Frederick was "the most consummate practical genius that, in modern times, has ascended a throne" (Acton, "Lectures on Modern History," xviii.).

J. S. LINDSEY.

Domestic Training in Welsh County Schools.

"NOTHING lovelier can be found in woman than to study household goods" (Milton).

The comfort and health of a household depend so much upon the housewife, that domestic subjects, such as cookery, laundry-work, and housewifery, should form an important part in girls' education. In the majority of schools, one lesson a week of two hours only is given to cookery, and an experienced person alone can understand the difficulty under which a technical instructress has to work. However, it is a pleasure to know that some schools are making progress in this direction. During the last two years the technical department of my school has received every encouragement, both from the headmistress and governors, who both take the greatest interest in this technical work.

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Thursday.—Boiled fish, parsley sauce, bread, potatoes.

Friday.—Brown stew, potatoes, bread.

Monday.—Haricot soup, bread, marmalade pudding.

Tuesday.—Meat pies, potatoes, bread.

Wednesday.—Stewed liver and bacon, vegetables, bread.

Thursday.—Welsh soup, apple dumplings, milk, sugar.

Friday.—Irish stew, bread.

The ingredients are bought, where possible, in large quantities. Bread is made by the girls, and baked in school.

S. A. DAVIES.

County School, Bala.

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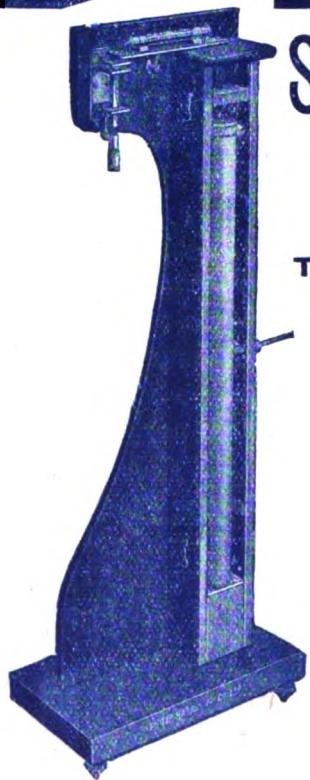
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The School World

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SIXPENCE.

EDUCATION AND THE EMPIRE.

By HAROLD W. ATKINSON, M.A. (Cantab. and Cape),
Late Headmaster of the Boys' High School, Pretoria.

THE Colonial Conference of 1907 belongs already to the past; its results lie still in the future. The Federal Conference on Education, which will also have been concluded by the time this article is published, may lead to results as important to the Empire as those of the Colonial Conference. It is, in any case, indicative of imperial feeling and at the same time a happy augury for educational unity that a Conference of imperial representatives from the Departments of Education should follow so closely on that of the Colonial Premiers, and that it should have received such genuine support from the Governments and institutions represented.

The Colonial Conference did indeed touch upon the question of reciprocity between the various parts of the Empire in the matter of certain professions and qualifying examinations. On May 8th the Colonial Office précis of the Conference proceedings contained the following paragraphs :

Barristers.

The Conference decided to record and to reserve for further consideration the following resolution of the Government of New Zealand :

"That provision should be made throughout the Empire for the reciprocal admission of barristers to practise, and, in particular, that the mere fact that in any dependency the two branches of the profession are amalgamated should not be a bar to the admission of barristers of that dependency to practise in England or elsewhere."

Land Surveyors.

The following resolution was agreed to :

"That it is desirable that reciprocity should be established between the respective Governments and examining authorities throughout the Empire with regard to the examination and authorisation of land surveyors, and that the memorandum of the Surveyors' Institute on this subject be commended for the favourable consideration of the respective Governments."

The Federal Conference on Education, which was arranged by the League of the Empire, dealt with a comprehensive programme, the agenda for which was submitted to the Heads of the Education Departments.

In addition to the official conferences of the
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Heads of Departments, there were general conferences of delegates from educational bodies, open meetings, and discussions in sectional meetings of special matters of interest to educationists.

It has been said that it is not the debates in the House of Commons that are of importance, but the discussions in the lobbies; and probably one of the most important results of the occasion will be the personal acquaintances formed and the personal interchange of ideas and opinions that will have taken place outside the actual meetings.

Educationally as well as politically the Empire is not a unity but a collection of units. The physical, racial, commercial and political problems, widely variant in the different parts of the Empire, have all of them influenced to a greater or lesser degree the widely variant attempts at the solutions of educational problems.

Is it possible, now in the twentieth century, to attain to a greater uniformity of system of education throughout the Empire, or, *faute de mieux*, to establish a scheme of compromise, a basis of reciprocity that may favourably modify, if not at once abolish, the anomalies that result from existing conditions? A teacher with his full first-class professional certificate from one part of the Empire may go to another part and find that he can only obtain therewith a third-class certificate. The examination certificate of a pupil from one colony does not by any means carry equivalent privileges in another colony.

A fully-qualified surveyor may find that migration to another British possession involves a renewed series of examinations and their attendant payments of fees. Such conditions hinder imperial development. The surveyor loses valuable time and the Empire is deprived temporarily of the results of his work. The pupil has to find a new footing and his education suffers, and the Empire loses time that he might have devoted to its services. The teacher hesitates to move from the position which his first-class certificate guarantees him, to take up a post under a third-class certificate with its lower position and lower grade of salary; and each part of the Empire suffers from the results of prolonged interbreeding and from the loss of the advantages that arise from the introduction of new blood.

It is not possible to discuss here in detail the

many problems with their possible solutions that are presented by the questions that were before the Conference. Lack of space would prevent it, even if it were not necessarily precluded by the fact that probably no one person is sufficiently acquainted with all the varying conditions of the different portions of the Empire. Some of the leading facts in relation to, and some of the more prominent reasons for, these varying conditions may, however, be set down, and some possibilities, and indeed impossibilities, pointed out in the direction of a greater uniformity or a reciprocity in educational matters.

There have been of recent times, signs of a willingness on the part of various educational bodies to move in the direction of uniformity and reciprocity. At home, the universities have adopted schemes of joint scholarship examinations; the public schools have adopted a similar scheme for their entrance examinations; and a more liberal spirit has been shown by the universities in the acceptance of one another's matriculation standards. Abroad, such conferences as those between representatives of the South African States on educational standards and codes betray a like recognition of the necessity of co-operation. At the same time we find, at home, each university satisfied to retain its own special curriculum and examination for a teacher's diploma, unwilling to recognise for the purposes of its own degrees periods spent in study at another university; we find, too, a multiplicity of external examining bodies, each with its own *clientèle*; and abroad, the same South African States unable to agree to one South African University, but rather desirous each to possess its own separate university, and maintaining rival standards of examination.

The causes of such heterogeneity are not far to seek. The conditions and requirements of colonial life are often not the same as those prevailing at home. The ideals of the Heads of the Education Departments are widely different, and lead to the formulation of widely differing codes and schemes; some essentially practical, some rather idealistic and over-ambitious, and, by the way, some secular and others religious. The racial conditions of some colonies necessitate provision for the teaching of languages which in others are of no value. (Dutch, Sesuto, and Zulu are provided for in the Cape schemes, and Dutch in the Transvaal codes, but none of these would be of any value in the Dominion or the Commonwealth.) The educational schemes of the colonies date from different periods, were evolved to suit as far as possible the particular environments, and have undergone changes prompted by like considerations. The difficulty of introducing harmony or compromise is sufficiently evident at home. How much more difficult will the task be to attain such result between the outlying parts of the Empire or between them and the mother country.

It would appear that the movement for educational federation should commence from above,

from the universities. Three reasons, at least, suggest this. The universities are less hampered by State control, and would be more free to decide on a mutually acceptable basis of a general liberal education. Being fewer in number than the institutions of a lower standard of education, discussion becomes more practicable and practical. An agreement among them on a reciprocally recognised matriculation standard would, at once, simplify the next stage of the process, the standardisation and normalisation of the school leaving examinations. Of these the higher should be such as to admit the student to any university in the British Empire, and would thus be the centre point from which any student's higher education would be developed and specialised, and up to which the secondary and primary education would lead. It would be the standard, from which downwards the grades of the secondary and primary schools would be calculated. Below this school leaving examination, or Imperial Matriculation, there might be a lower certificate examination for such pupils as must necessarily, from one cause or another, leave school at an earlier age. The general standard of this should, in like manner, be uniform throughout the Empire, so that to whatever British possession the owner of such a certificate might pass, he would find a ready recognition and immediate understanding of his educational qualifications. It is evident that for the successful development of such a scheme in the first instance, and still more for the successful maintenance of its working efficiency, various things are necessary.

First, the general basis of the imperial matriculation must be such as to offer a fairly wide field of subjects, of which a minimum number should be universally compulsory, and a further minimum number be compulsory alternatives. The first group of subjects with various combinations from the second group would comprise the necessary imperial matriculation standard, admitting to any British university, the particular schools to which the student would be entitled to admission being determined by the subjects taken in the second group.

Secondly, the provision of a central Imperial Education Office, one of the functions of which would be to act as a moderator in the imperial matriculation.

Thirdly, regular Imperial Education Conferences for the discussion of alterations and modifications necessitated by the progress in educational theory and practice.

Fourthly, the scheme should probably leave room for the inclusion in the curriculum of any particular British possession of some subject (or subjects) that might with advantage be studied there but would not be of special service elsewhere.

Fifthly, a necessarily concomitant parallel scheme for the qualification required for teachers' diplomas.

Some such scheme as the above would render possible, far more possible than under present

conditions, the passage of a pupil from a school in one State to a school in another, the passage of a teacher from one Education Department to another, and would aid in strengthening the bonds of empire by the establishment of an educational *esprit de corps*, limited in its influence only by the bounds of the British possessions.

How far such interchange of pupils or teachers is desirable, or even how far the interchange of inspectors or of university professors, would benefit the Empire's education is a matter of opinion in the first place, but of experiment in the second. Schemes have been mooted of interchange of pupils—the scheme provided by the will of the late Mr. Cecil Rhodes to enable colonial students to study at Oxford is in successful operation—and examples have been known of temporary appointments of administrative officials. A few considerations on these points may be here briefly noted.

Probably the interests of the pupil are best served by carrying through his education as far as possible under constant conditions. No inconsiderable number of pupils are sent, however, from some of the colonies to complete their education in England, and the transition would be more easily effected under the conditions that a normalisation of standards would ensure than under such as at present prevail.

The interchange of teachers must be considered under two heads, temporary interchanges and those of a more permanent character. The advantages of temporary interchanges are very questionable. The conditions of life, with their variations in climate, habits, and customs of the country, different temperaments and characteristics of the pupils, involve some study and gradual assimilation before the teacher's work in the new environment can be as efficient as in the old, and many mistakes may be made and friction caused before this point is reached. Changes of a more permanent character may prove, indeed often have proved, advantageous to the country adopted by the immigrant teacher, who may often introduce a new element, or re-introduce a forgotten point of view, and thus add new vitality to or revitalise some part of the system.

The interchange of inspectors or members of the administrative staff is fraught with more risk than that of teachers, because the evil effects of errors are more far-reaching. Probably no temporary inspector should hold his post for less than two years, and part of his first year would generally be spent in observation and assimilation before he commenced routine work and actual administrative inspection. The same, *mutatis mutandis*, would in most cases apply to temporary appointments to the administrative staff. Cases might be quoted from the colonies to show that in some cases where the appointments have been held for about two years, excellent results have accrued with permanent benefit to the colony, while a shorter appointment has perhaps left a heritage of error to be weeded out after the official's retirement.

The advantages that might accrue from an interchange of university professors or lecturers are twofold. First, students who could not leave their country would be enabled to hear and meet men prominent by reason of their learning or their personal influence; secondly, university teachers of such subjects as biology, zoology, anthropology, politics, economics, &c., would have the opportunity of making a personal and direct local study of branches of their respective subjects.

Apart, however, from actual appointments to temporary responsibility, observational visits of teachers, inspectors, or officials, even though such visits be of short duration, could but be of advantage, and, in most cases, of advantage to both sides. Comparisons of methods, aims, and ideals, as well as of results, would be helpful to both sides, and would tend to eradicate the abnormalities without destroying the individualities of the various departments.

Liberty in action combined with unity in aim must be the essentials of any such scheme of federation. This must apply not only to the general basis but also to such details as the choice of apparatus and text-books. Here again a central office might do good work in disseminating information on the productions of the various colonies, whereby originality and successful authorship might benefit the whole Empire instead of, as is often the case at present, benefiting only the country of origin.

The Central Office would be, indeed, the central fact of the whole scheme. Intercommunication could only be successfully maintained through such a channel. Its work would be multifarious and its organisation necessarily complex, but, in the interests of utility, not complicated. It would be a sort of Perpetual Imperial Mosely Commission, combining in its functions the passivity of accumulating facts and the activity of suggesting courses of action, or of passing round for criticism courses of action suggested from outside.

Idealistic will be, perhaps, the adjective applied to all this by some critics, or others will deprecatingly label it "made in Germany." Neither criticism is, however, condemnatory. So long as a nation's success is largely dependent on the people's education, so long as an empire's strength is held to be increased by some form of federation, so long will it be possible to increase an empire's power and knit closer the bonds of unity by some form of federated education.

Elementary Science for Pupil Teachers. By W. T. Clough and A. E. Dunstan. 183 pp. (Methuen.) 2s.—This volume covers the general science portion of the syllabus in elementary science for the preliminary examination for the certificate, and it will meet satisfactorily the requirements of candidates. The collaboration of the authors does not appear to have been sufficiently close; thus, more than two pages (pp. 65-7) on the effect of heat on water, in the physics section, are reproduced almost verbatim in the chemical section (pp. 135-7). In this manner valuable space has been lost.

THE EMPIRE AND THE SCHOOLS.

By F. J. C. HEARNSHAW, M.A., LL.M., F.R.Hist.Soc.
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the Historical Association.

A FEW years ago we were all, according to the late Sir William Harcourt, Socialists. Now we are all Imperialists. So strong a feeling for empire is to-day everywhere manifested, whether on platform or in Press, in churches or in schools, that it is difficult to realise that it was only yesterday that enthusiasm took the place of indifference, and only the day-before-yesterday that indifference supplanted active hostility. To give more precise dates, in the fifties and sixties of the last century, the colonies were regarded with energetic dislike. They were looked upon as turbulent and discontented children, impecunious and petulant, some of them doubtfully legitimate. They continually embroiled the mother country in vexatious quarrels, in harassing and unremunerative wars. They yielded small return in gratitude, or markets, or support. Hence in 1852 Mr. Disraeli voiced the general sentiment of England when he said: "These wretched colonies . . . are a millstone round our necks."

In 1855 Lord Palmerston, when he temporarily took charge of the Colonial Office, professed an ostentatious ignorance of the very names and geographical situations of the colonies whose affairs he was to administer. About the same time Sir George Cornewall Lewis condemned colonial possessions as useless and dangerous; Dr. Congreve urged our recession of Gibraltar to Spain and our retirement from India; a Committee of the House of Commons advised our withdrawal from the West Indies; while Lord Thring actually drafted a Bill for cutting the colonies adrift. But perhaps the most remarkable testimony of all was that of Lord Blachford, who was permanent Under-Secretary for the Colonies from 1859 to 1871. In a letter written so late as 1885, he said:

"I had always believed—and the belief has so confirmed and consolidated itself that I can hardly realise the possibility of anyone thinking the contrary—that the destiny of our colonies is independence, and that in this point of view the function of the Colonial Office is to secure that our connection while it lasts shall be as profitable to both parties and our separation when it comes as amicable as possible."

But Lord Blachford, when in his retirement he wrote these words, was even then giving expression to an obsolete opinion. Long before 1885 the leaders of English political thought had begun to view the colonies with other eyes. On the one hand they saw the British dominions beyond the seas developing in prosperity and power, establishing themselves in orderly government and self-sufficiency, a heritage not to be lightly abandoned; on the other hand they realised that the day of small nations was passing away, that the era of empires had dawned. The unparalleled expansion

of Russia and the United States, in both territory and population, during the first three quarters of the nineteenth century had indeed forced all the old Powers of Western Europe to recognise the fact that the long-established "balance of power" was irretrievably destroyed. Germany, France, Italy, all started to scramble for colonies, the raw material of empire. With them patriotism became, as Mr. J. M. Robertson has acidly defined it, "the love of more country."

Great Britain, fortunately, had not to begin at that late date the task of laying the foundations of empire. Her unregarded sons during many generations of unrecognised toil had done that for her. But she had, amid the profound indifference of her insular proletariat, to undertake the hardly less onerous task of forming out of her infinitely various and widely scattered colonies and dependencies a Federated Empire. Mr. W. E. Forster, Sir Charles Dilke, Lord Carnarvon, Mr. J. A. Froude, Prof. Seeley, Lord Tennyson, were pioneers of the imperial idea. In the late seventies and early eighties they spoke and wrote with unceasing devotion on behalf of the new political gospel.

In 1883 appeared Seeley's epoch-making lectures on the Expansion of England; in 1884 the Imperial Federation League was formed; in 1886 Mr. Froude published his "Oceana," a fascinating product of zeal, enthusiasm, indiscretion, and error. Lord Rosebery took up the cause of empire; Mr. G. R. Parkin began his series of missionary journeys; Mr. Rudyard Kipling burst forth into imperial song. Finally Mr. Joseph Chamberlain transferred the abilities which he had once devoted to the improvement of Birmingham and the establishment of an English republic, to the consolidation of Greater Britain and the founding of a world-wide British dominion. In a great speech delivered at Johannesburg in January, 1903, he said:

The day of small kingdoms with petty jealousies is past. The future is with the great empires. There is no greater empire than the British Empire. The mother country has set the example. She has thrown off the apathy and indifference of past generations. No longer do we hear of statesmen to whom separation from the colonies is almost an object of desire. The colonies on their part have reciprocated that feeling. They have abandoned provincialism, and are agreed to claim their part in the glorious empire which is theirs as well as ours. They are ready to take the obligations which go with privileges. That is the spirit which exists and which I desire shall continue. Let us say with the colonial poet:

"Unite the Empire, make it stand compact
Shoulder to shoulder; let its members feel
The touch of human brotherhood, and act
As one great nation, true and strong as steel."

When Mr. Chamberlain spoke, indeed, and not a little owing to his rousing energy, the propagandist work of a quarter of a century had been accomplished; the British public had at last been stirred; the nation had become imperialist.

The adult part of the population having thus

been converted, the question inevitably arose: how shall the infant mind be trained in the true imperial creed? The supply of imperial textbooks was miserably inadequate. One writer, Prof. Woodward, of Liverpool, had said in 1899:

No civilised nation treats its national history with such scant regard as Englishmen. It surprises foreigners to see how phlegmatically we ignore the story of our great dominion, an unconcern which reacts inevitably upon our schools of all types and grades. If Germany, for instance, had such a history as ours, it would be the central object round which all their national education would revolve.

As soon, however, as the fire of imperial enthusiasm was fully kindled throughout Great Britain and the colonies—that is, to speak generally, during the period of the critical conflict in South Africa—both writers and publishers set to work with eager diligence to fill up the blanks in imperial literature. As the result of their labours the old reproach is entirely wiped away. Not Germany itself, that educational paragon, can boast a finer or more varied collection of material for the instruction of the rising generation in patriotic history, geography, and civics.

This present year, 1907, however, a special effort in missionary propaganda is being made, and that quite naturally and properly. It is precisely three hundred years since Virginia, the first successful English settlement, was founded; it is just two centuries since the consummation of the union of England and Scotland; it is the first centenary of the abolition of the slave-trade; while the year 1907 itself has been made notable by the assembling of the most important Colonial Conference of modern times. This is, therefore, pre-eminently a jubilee-year of Empire. In the circumstances it is not surprising that various organised bands of imperial-educationists are manifesting extraordinary, if not always judicious, activity. The Victoria League is continuing and extending its good work of informing the people of the mother country concerning the colonies, and the people of the colonies concerning the mother country. The League of the Empire (founded in 1901), backed by a gift of £5,000 from the late Mr. Louis Spitzel, is embarking on a scheme of publication of "a graded series of text-books on the Empire, which shall not only furnish the youth of the Empire with first-hand information, but through the financial value of the publications provide a fund for the advancement of education throughout the Empire, wherever the books shall be used." Finally the Lord Mayor of London and an influential body of representative men inaugurated in the Guildhall, on April 23rd of the current year, an "Empire Education Fund"—towards which the Princess of Wales has been instrumental in obtaining some £4,000—to provide lantern slides, arrange lectures, provide books of information, &c., &c., concerning the Empire. Truly we have moved far from the Disraeli and Palmerston position of fifty years ago!

But, while it is gratifying to see imperial organisations with thousands of pounds at their disposal actively employed in disseminating instruction and fostering enthusiasm, it is to be feared that there is a danger that the possession of large definitely-allocated funds will lead to a good deal of overlapping, competition, and waste, especially as some of those who at the present moment are most conspicuous in zeal are least conspicuous in knowledge of what has already been accomplished. For example, Mr. A. H. P. Stoneham, who was prominent at the Guildhall meeting, had, he professes, found "great trouble in obtaining an up-to-date map of the world showing all the possessions of Great Britain." Considering that the wholly admirable Navy League map, the excellent Howard Vincent map, and the ingenious and valuable Macaulay map—all up-to-date and exhaustive—can be obtained through any bookseller, one can only conclude that Mr. Stoneham found "great trouble" in discovering these maps only because he did not read the educational papers in which they are freely advertised and did not know where to inquire. The same conclusion is forced upon one when one reads that Mr. Stoneham experienced equal difficulty in unearthing "a suitable text-book for the use of teachers in the schools," especially when he confesses that, as the result of his toilsome and distressful searchings, he succeeded in finding only—"The Emigrants' Handbook to the Colonies"!

It is clear that Mr. Stoneham—whatever may be the case with the other administrators of the Empire Education Fund—is some five years behind the times. One suspects, too, that the History Section of the League of the Empire, which is controlling the "Imperial Text-Book Scheme," will find some difficulty in discovering a sphere of enterprise which has not been effectively surveyed and worked, during the past five years, by more than one energetic author and publisher. The "great trouble" to-day, in fact, is not to find suitable text-books, but to choose from among the immense number, excellent in form and contents, which private enterprise has placed upon the educational market. I propose to close my article by giving (so far as my knowledge goes) a summary list under the names of the several publishers (arranged in alphabetical order) of the more useful and important books, with other materials, designed to further the knowledge of the Empire and a recognition of the duties of citizenship.

BIBLIOGRAPHY.

I. MR. EDWARD ARNOLD.

(1) *Home and Abroad Readers, Book IV.; Gateways to History, Book IV.; Steps to Literature, Book IV.* 1s. 6d. each. These are three volumes in Mr. Arnold's series of co-ordinated readers. The first deals with the geography, the second with the history, the third with the literature of the Empire. That they are up to date is shown by the fact that among the provinces of Canada are mentioned Alberta and Saskatchewan, which were raised to that dignity only in 1905.

(2) *The Australian Commonwealth and The New Zealand Colony.* 1s. each.

(3) *The Romance of Empire.* By Philip Gibbs. 5s. An ideal prize-book or gift-book for a boy. In seventy-three chapters it describes the heroic and dramatic incidents which have marked the development of the Empire from the days of Raleigh to those of Lord Roberts.

II. MESSRS. G. W. BACON AND CO.

(1) *Excelsior Map of the World.* 15s. A special "British Empire Edition" with all British dominions marked in red.

(2) *Elementary Map of the World.* 12s. A simpler wall map for junior classes.

(3) *Atlases of British Empire* at various prices.

III. MESSRS. A. AND C. BLACK.

(1) *Descriptive Geography of the British Empire.* By F. D. Herbertson. 2s. 6d. This book, with its forty illustrations, takes the reader as on a journey through the Empire, depicting and informing by the way.

(2) *Prof. Lyde's Geographical Readers* (1s. 4d.) include one, No. iv.c, dealing exclusively with the British Empire.

(3) *Black's Literary Readers* (1s.) have just begun to appear. The special feature of four of them is announced to be that "an attempt is made to show how Britain came by her world-wide Empire."

IV. MESSRS. BLACKIE AND SONS.

(1) *A Survey of the British Empire.* 2s. An account, historical, geographical, and commercial, of the building of the colonies.

(2) *The Geography of the British Empire.* By W. G. Baker. 3s. 6d.

(3) *The Growth of Greater Britain.* Book VII. in the "Raleigh" Series of History Readers. 1s. 9d.

(4) *The British Empire in the Nineteenth Century.* 1s. 6d. A well-illustrated account of recent developments.

(5) *Blackie's English School Texts*, edited by Dr. Rouse (6d. each), include some valuable "empire books"; for example, the "Travels of Captain John Smith," Raleigh's "Discovery of Guiana," and Drake's "World Encircled."

(6) *The Growth and Administration of the British Colonies, 1837-97.* By W. P. Creswell. 2s. 6d. A volume of the Victorian Era series, now somewhat antiquated.

V. THE CAMBRIDGE UNIVERSITY PRESS.

(1) *The Expansion of the British Empire, 1500-1870.* By W. H. Woodward. 4s. A standard work of 326 pages giving a full, lucid, and interesting narrative of the whole course of imperial history; one of the most useful textbooks available. There is also an abbreviated edition for the use of junior forms at 1s. 6d.

(2) *A History of the Australasian Colonies.* By E. Jenks. 6s.

(3) *A History of Canada, 1760-1900.* By Sir J. G. Bourinot. 6s.

VI. MESSRS. CASSELL AND CO.

(1) *Round the Empire.* 1s. 6d. Dr. G. R. Parkin's popular book of travel, which has reached its 153rd thousand. Its aim is to excite interest and to further the cause of federation.

(2) *Our Empire Series* (1s. 6d. each) includes "Founders of the Empire," "India" and "Australasia," by Philip Gibbs; and "Canada," by A. L. Haydon.

(3) *Pictures of Our Empire.* 6d. each. A new and interesting venture on which Messrs. Cassell are just embarking. One sheet, containing six excellent representative views of Australia, is to hand. Seven others are announced relating respectively to London, Scotland, Ireland, India, Africa, Canada, and West Indies. Each sheet is 27 in. x 31 $\frac{1}{2}$ in. in size.

(4) *The Citizen Reader.* By H. O. Arnold-Forster. 1s. 6d. A book on the duties of citizenship, of which 394,000 copies have been sold.

VII. MESSRS. W. AND R. CHAMBERS.

(1) *Britain Beyond the Seas.* 1s. 6d. A well-illustrated and readable book of 288 pages descriptive of the British colonies and dependencies.

(2) *The Nineteenth Century Series.* 5s. net each. Five authoritative volumes depicting the progress during the century of South Africa, Canada, New Zealand, Australasia, and the British Empire as a whole.

(3) Readers on "Greater Britain," "Children of the Empire," &c., at prices from 1s. upwards.

VIII. MESSRS. J. M. DENT AND CO.

(1) *A Short History of the English Colonies.* By Agnes F. Dodd. 2s. 6d. A useful introductory sketch.

(2) *Dent's Encyclopaedic Primer Series* (1s. each net) includes "The Government of Greater Britain," a valuable constitutional handbook, by W. F. Trotter; "South Africa," by W. Basil Worsfold; and "The Civilisation of India," by Romesh C. Dutt.

IX. MESSRS. HARRISON AND SONS.

Our Empire Past and Present. By the Earl of Meath and Others. To be completed in three volumes. Vol. i. "Great Britain in Europe." 7s. 6d.

X. MESSRS. W. AND A. K. JOHNSTON.

(1) *The Navy League Wall Map.* 72 in. x 63 in. 21s. This invaluable map shows distinctly the British Empire boldly coloured in red; naval stations named and outlined in red; wealth and social condition of the British Empire; principal navies and commerce; expenditure upon British warship building from 1876 to 1906; sources of our food supply; principal British trade routes and steamship lines with their distinguishing flags; fleets of principal maritime Powers; distances between various important ports; list of 112 naval engagements, from the Spanish Armada, 1588, to Alexandria, 1882; actual and projected submarine cables of the world. Reduced facsimiles, mounted on cloth (21 in. x 15 $\frac{1}{2}$ in.), can be obtained for 1s. each.

(2) *The Howard Vincent Wall Map,* 72 in. x 63 in. (21s.), is very similar in scope and design, but its tabular information is not so full. It shows "the possessions throughout the world of the British people in the reign of Edward VII., their extent, population and revenue; ocean routes with distances, royal naval stations and coaling stations over the world." Reduced facsimiles (6 in. x 4 $\frac{1}{2}$ in.) are provided at 8s. 4d. a hundred.

(3) *Captain Macaulay's Wall Map,* 66 in. x 42 in. (15s.), is somewhat simpler and less elaborate. It has been constructed specially in order to facilitate education. Its object is "to act as an automatic educator through the eye in imperial geography and imperial ideas."

(4) *Our Empire Atlas,* showing British possessions at home and abroad, containing fifty-nine coloured plates and complete index, with introduction by C. P. Lucas, of the Colonial Office. 6s.

(5) *Britain on and beyond the Seas.* By C. H. Crofts. 1s. 6d. This is a companion volume to the "Navy League

Map." It gives a sketch of British naval history from 1888 to 1900.

(6) *Through the British Empire in Ten Minutes.* By Sir Howard Vincent. 3d. A stirring Empire-day address, to which are appended some useful tables, characterised, however, by the compiler's well-known bias towards preferential trade.

XI. MESSRS. LONGMANS, GREEN AND CO.

(1) *Elementary Geographical Reader: The British Empire* (1s. 6d.), containing fifty-eight reading lessons with 100 illustrations and seventeen maps.

(2) *Advanced Geographical Reader: The British Colonies and Dependencies*, with maps, &c. 1s. 9d.

(3) *Text-book of Geography: The British Empire* (3s. 6d), including thirty-eight illustrations, seventy-one coloured and seven uncoloured maps.

XII. MESSRS. HORACE MARSHALL AND SON.

The Story of the Empire Series. 1s. 6d. each. This important and useful series deals in detail with the component parts of the Empire. It comprises thirteen volumes, as follows: (i) "The Rise of the Empire," by Sir Walter Besant; (ii) "The Story of India," by Demetrius C. Boulger; (iii) "The Story of Australia," by Flora L. Shaw (Lady Lugard); (iv) "The Story of Canada," by Howard Angus Kennedy; (v) "The Story of South Africa," by W. Basil Worsfold; (vi) "New Zealand," by the Hon. W. P. Reeves; (vii) "The Story of the West Indies," by Arnold Kennedy; (viii) "The Story of West Africa," by Mary H. Kingsley; (ix) "The Story of Egypt," by W. Basil Worsfold; (x) "The Story of the Uganda Protectorate," by Sir F. D. Lugard; (xi) "The Story of Newfoundland," by F. E. Smith; (xii) "The Story of Burma," by E. G. Harmer; (xiii) "Ireland and Her Story," by Justin McCarthy.

XIII. MESSRS. MACMILLAN AND CO.

(1) *The Expansion of England.* By Sir J. R. Seeley. 5s. These are the great lectures which did more than any other writings to bring Imperial Federation within the sphere of practical politics. They are almost as valuable now as they were when they first appeared nearly a quarter of a century ago. Extracts from them, under the title "Our Colonial Expansion," are published at 1s.

(2) *Imperial Federation.* By G. R. Parkin. 4s. 6d. A stimulating and able argument in advocacy of a federal empire. It was published in 1892.

(3) *Colonies and Colonial Federations.* By E. J. Payne. 3s. 6d. An exceedingly important and exhaustive study of the constitution and nature of the British Empire down to the year 1904. It is divided into four sections: (i) geographical, (ii) historical, (iii) economic, (iv) political. No student of the Empire and its problems can afford to neglect this book.

(4) *History of the British Empire.* By G. F. Bosworth. 2s. Primarily a history of England, but the later chapters contain a sketch of imperial developments.

(5) *The Web of Empire.* By Sir D. M. Wallace. 1s. 6d. This is an edition, abridged for the use of schools, of the writer's well-known account of the tour of the present Prince and Princess of Wales round the Empire in 1901.

(6) *Geography of the British Colonies.* By G. M. Dawson and Alexander Sutherland. 2s. A remarkably good elementary text-book by writers who are men of note, the one in Canada, the other in Australia.

(7) *The Citizen and the State.* Three useful text-books of civics. The first, "Representative Government," by E. J. Mathew (1s. 6d.), deals with the English Constitu-

tion, local and central; the second, "Industrial and Social Life and the Empire," by J. St. Loe Strachey (1s. 6d.), treats of economic and imperial affairs; the third, "The English Citizen," by C. H. Wyatt (2s.), defines the rights and duties of the subject.

(8) *The Globe Geography Readers.* By Vincent T. Murché. The "Intermediate Book" (2s.) deals with "Our Island Home"; the "Senior Book" (2s. 6d.) with "Our World-wide Empire." The illustrations, many of them coloured, are a notable feature of these attractive volumes.

(9) *Macmillan's South African History Readers.* Three graded volumes epitomising the story of South Africa. 1s., 1s. 4d., 1s. 6d.

(10) *Macmillan's Geography Readers.* Book IV., "The British Empire," 1s. 4d.; Book VI., "The Colonies of Great Britain," 1s. 6d.

XIV. MESSRS. MEIKLEJOHN AND HOLDEN.

(1) *The British Empire.* By J. M. D. Meiklejohn. 3s. An excellent geographical text-book produced with all Prof. Meiklejohn's well-known lucidity, and genius for arrangement.

(2) *The Building of the British Empire, 1497-1900.* By A. T. Flux. 2s. A convenient historical summary.

(3) *The British Colonies and Dependencies.* By M. J. C. Meiklejohn. 6d. A brief account of their resources and commerce.

XV. MESSRS. METHUEN AND CO.

(1) *A Historical Geography of the British Empire,* by Hereford B. George (3s. 6d), occupies a place apart, as showing the intimate connection between geography and history in the development of the Empire.

(2) *The Student's Historical and Modern Atlas of the British Empire.* By C. G. Robertson and J. G. Bartholomew. 4s. 6d. net. This complete and accurate atlas contains, besides sixty-three maps and plans, a historical gazetteer, statistical tables, and a useful geographical bibliography.

(3) *British Colonial Policy.* By H. E. Egerton. 10s. 6d. A book indispensable to the teacher who wishes to go behind the events of colonial history to the ideas and purposes which determined them.

(4) *The Rights and Duties of a Citizen.* By H. E. Malden. 1s. 6d. The closing chapters deal with army, navy, and empire.

XVI. MR. JOHN MURRAY.

(1) *The Growth of the Empire.* By A. W. Jose. 4s. 6d. A finely written, fascinatingly interesting, and most inspiring history of the expansion of England. No better preliminary survey need be desired.

(2) *Britain over the Sea.* By Elizabeth Lee. 2s. 6d. A reader for schools, containing many interesting passages from original sources of knowledge of the Empire.

(3) *English Colonisation and Empire.* By Alfred Caldecott. 3s. 6d. An original and suggestive study of the history of the Empire from the point of view of the philosopher to whom political science, political economy, and ethnology are subjects of prime importance.

(4) *The Rise of the British Dominion in India.* By Sir Alfred Lyall. 3s. 6d. One of our best brief authorities on its subject.

(5) *The "Empire League" Publications.* 2s. 6d. each. A series of text-books issued under the auspices of the League of the Empire. Up to the present two volumes have been published. One is called "Empire Builders," by W. K. Stride; it contains biographical sketches

of Alfred the Great, Drake, Clive, Wolfe, Hawke, and Cook—a somewhat eccentric selection. The other is termed "Colonisation and Empire," by F. A. Kirkpatrick; it consists of six lectures on the period 1600-1783. It is interesting to note that each lecture is accompanied by a list of illustrative lantern-slides, and that these slides can be hired from the offices of the League.

(6) *History and Geography of the Empire*, by E. F. Knight, a work embodying much research and enlivened by many first-hand descriptive sketches, is in active preparation.

XVII. OXFORD UNIVERSITY PRESS.

(1) *The Origin and Growth of the English Colonies*. By H. E. Egerton. 2s. 6d. A preparatory sketch by the new Professor of Colonial History at Oxford.

(2) *A Historical Geography of the British Colonies*. By C. P. Lucas. Six volumes ranging in price from 5s. to 9s. 6d. each; the whole, 43s. The fullest storehouse of information concerning the Empire in detail, especially the West Indies and other scattered possessions.

XVIII. MR. EDWARD STANFORD.

(1) *Map of the British Colonies and Possessions*, 1902, on a uniform scale. 13s. This is not a map of the world. Only the component parts of the Empire are given, each in a separate panel.

(2) *Companion Map to the above showing the Empire in 1837*. 13s.

The above are the principal "empire books" useful to teachers with which I am acquainted. I think it will be admitted that in respect of them the main difficulty is that of selection. Yet in spite of their number and variety I must mention one or two additional works valuable for reference. Those who wish to supplement their textbooks with the latest facts and figures would do well to secure copies of the current annual volumes of the "Colonial Office List" and the "India Office List" (Harrison and Sons, 10s. 6d. each), or to consult Dr. Scott Keltie's encyclopædic "Statesman's Year Book" (Macmillan, 10s. 6d.). In 1892 a very handy "Colonial Chronology," by Mr. H. J. Robinson, was published by Messrs. Lawrence and Bullen, but I believe that it is now out of print. In conclusion, I shall be very grateful to publishers, authors, and others, who will tell me of useful works not mentioned in the above lists.

THE PRELIMINARY EDUCATION OF ELEMENTARY SCHOOL TEACHERS.

I. FROM THE POINT OF VIEW OF THE SECONDARY SCHOOL.

By S. ELFORD, M.A.

Headmaster, Coopers' Company's School, Bow, E.

M R. MORANT, in the prefatory memorandum to the new regulations, whilst paying tribute to the way in which secondary schools all over the country have co-operated with local authorities in providing a more thorough and efficient education for elementary-school teachers, admits that the practical difficulties are many and real, and it is to obviate some of these that the new regulations have been framed. They seem, however, rather to provide for an additional

source of elementary-school teachers than to improve the present state of affairs.

Under the existing pupil-teacher system the chief difficulty the secondary school has to contend with is the absence of the pupil teacher from the school for a whole term from time to time, though this is preferable to the absence on certain days in every week, as was the case in the pioneer schools a few years ago.

To frame a time-table and curriculum to meet the requirements and satisfy the Board of Education under the Regulations for Secondary Schools alone is a difficult matter, but to arrange for the efficient and economical working of the school and at the same time to conform to both the Regulations for Secondary Schools and the Regulations for Pupil Teachers is much harder, and to these are now added a third set of regulations with which the headmaster must make himself familiar.

For some part of the year the forms in which the pupil teachers are placed are depleted, and either the remnant remaining in the form must go to a certain extent mark time, or the pupil teachers on rejoining the school after their period of practical teaching must leave gaps in their scheme of work, to be filled or not as occasion offers. Either the pupil teacher must in a certain measure be sacrificed to the ordinary scholar, or the ordinary scholar to the pupil teacher.

Where there is a sufficiently large number of pupil teachers attending the school they may be formed into a class or classes by themselves, but then they are apt to form a clique and lose touch with the school life, and so fail to obtain one of the chief benefits they are expected to derive from a secondary-school education; moreover, the teacher in charge of them is for a whole term at a time practically without any regular employment.

As a solution to this state of affairs, the Board of Education proposes the appointment of "Bursars." It is to be feared that the proposals will in no way meet the difficulties, though they may supply to a very limited extent an additional source of teachers.

The bursars (to be between the ages of sixteen and eighteen) may be recommended for approval by the local education authority if certified as likely to prove suitable both mentally and physically by the headmaster, and if they have also been approved by H.M. inspector. They must have been for two years, and after August, 1909, for three years, previously in the secondary school. They will receive free tuition for one year, and during that time will be expected to pass some public examination which will qualify them for admission to a training college. They will also receive a maintenance bursary, in part provided by the Board of Education and in part by the local authority, but the value of this is to depend on the financial position of the parent. The regulations impress on the local authority the need for due economy in awarding this maintenance bur-

sary, so to begin with, at any rate, the amount is not likely to exceed £10 per annum, £5 of which will be contributed by the Board, and the parent will also have to submit to some form of inquisition.

The Board will also pay a grant of £10 per bursar under certain conditions to the local authority, in addition to the £5 towards maintenance, and will also allow £2 towards examination expenses, but only if the candidate is entered for a school leaving examination conducted by a university, and provided it is of not less than matriculation standard.

At the end of his year's tuition, if he is over seventeen years of age, the bursar may proceed direct to a training college, the age of admission in his case being lowered by a year if he is under seventeen, or if there are no vacancies in the training college he can be employed as a student teacher for twelve months (chap. vii. of the Regulations), after which period of service he can be recognised as an uncertificated teacher.

The bursar system, if it entirely superseded the pupil-teacher method of entering the teaching profession, would ensure the future teacher at least four full years uninterrupted tuition in a secondary school, and this, from the school point of view at any rate, is very desirable. However, the bursar scheme is only to be tentative, and an optional alternative to the pupil-teacher system. It is evident that the Board does not contemplate the former taking the place of the latter, because the new regulations also provide for preparatory classes of boys and girls intending to become pupil teachers.

The existing supply of elementary-school teachers is scarcely adequate, and it is hardly to be expected that local authorities will run any risks or do away with one means of supply until they can feel certain that the new one will prove more efficient. Consequently they will regard bursarships only as a means of augmenting the ordinary supply rather than of taking its place.

It is to be feared that but few will take advantage of the new facilities. Parents naturally look at the question from a financial point of view. The pupil teacher does earn a small but progressive salary during the time of his indenture irrespective of his parent's income. The bursar will receive a comparatively small maintenance grant varying inversely with his father's income. In rural districts, where secondary schools are small and few and far between, the number of bursars will necessarily be small.

If it is definitely and finally decided that it is to the best interests, not only of the elementary-school teachers themselves, but of elementary education generally, for teachers to receive their preliminary education in secondary schools, the simplest process seems to be to make the bursar system, if not the only, at any rate the main source of supply; but then it must be under more liberal conditions. The reply to this will be that unless you catch your teacher young and bind him down you won't get him at all. As things are at present

there is a good deal of truth in this. But why? There is no dearth of candidates for those snares and delusions, temporary boy clerkships. There are thousands of candidates each year for a few hundred vacancies in the second division Civil Service clerkships.

In my own school of some 500 middle and lower middle class boys every third or fourth parent, when entering his son, tells me that he wishes him to enter the Civil Service. In four years only two boys, exclusive of county scholars or probationers, have taken up elementary teaching. The reason for this is twofold. Parents know little or nothing about the advantages or disadvantages of teaching as a profession. Cheap guides to the Civil Service are published and are in everyone's hands. The London County Council certainly does publish a *Gazette* each week, but it reaches only a limited number, and in it appear details of every branch of employment under the County Council—including education. If a parent's attention is drawn to the teaching profession as a career for his son, and he asks for printed particulars and is referred to the *Gazette*, he decides that his son shall take up some other branch of the public service set forth in the *Gazette* and perhaps a little better paid. There seems to be need for the local authorities to print and circulate freely, by means of the schools, secondary and elementary, if thought desirable, a clear and concise statement of the various methods of becoming an elementary-school teacher, the conditions of service, salaries, and prospects, &c. This must be set forth in simple and not official language, must not require expert interpretation, and must be easily understood by the man in the street.

The second reason is the financial one. It must be remembered that elementary-school teachers will always be drawn to a great extent from a class that have to keep up appearances on incomes frequently far less than those of mechanics and artificers, and who are unwilling and often unable to maintain their children, at any rate the elder ones, beyond a certain age. A fairly smart boy of fifteen can generally earn from 10s. to 15s. a week as a junior in a city office, though his future prospects as a clerk are not very promising. Many parents are compelled to sacrifice the future of their children to the needs of the moment, and the father excuses or justifies the withdrawal of his son from school at so early an age, and the placing him in a situation that offers but little prospect, by stating that the boy can continue his education at evening classes, and work on with a view of eventually reaching the goal of a second division clerkship.

If parents are to be brought to regard teaching as a suitable career for their sons, the conditions must be such that the training does not fall too heavily on the parent, and the embryo teacher must receive during his period of training a sum, either as a bursary or a maintenance grant, somewhat approaching that which he could expect to earn in other walks of life. The class that will take up elementary-school teaching want to, and

often must, become practically self-supporting at an early age, and so more generous treatment is necessary.

The whole question bristles with difficulties, and a solution has yet to be found. Schemes that will answer in towns are useless in country districts, and *vice versa*. The Board of Education, instead of facing the question and devising new machinery to meet the new conditions, has been tinkering with the old. The present state of affairs may be likened to a motor-car, the machinery of which has broken down, being towed by a horse; it is certainly progressing along the road but not at all in the way it should.

II. FROM THE POINT OF VIEW OF THE TRAINING COLLEGE.

By J. W. JARVIS,
St. Mark's College, Chelsea.

"The old order changeth, yielding place to new." The pupil-teacher system was established in 1846, it was re-modelled in 1903, and the regulations just issued introduce another new system to remedy the defects created by the last improvement. Formerly a pupil teacher in attendance for instruction in a secondary school was obliged to spend a certain portion of each year in an elementary school in order to obtain practical acquaintance with the art of teaching. This part-time attendance proved a difficulty in the way of the proper organisation of secondary schools, and now the experiment is to be tried of arranging for intending elementary-school teachers to receive continuous education in the secondary schools, and to defer attempting practical work until they have completed their course of instruction. This resembles the American system common in nearly all of the States of only admitting graduates from high schools to the normal colleges. These new people are to be called bursars, and they are to be admitted to a qualifying preliminary examination between the ages of sixteen and seventeen. The minimum age of admission to a training college is to be reduced to seventeen, so that they may pass straight into the training college at the close of their period of bursarship.

Now comes a new problem which will have to be faced by the training college authorities. As these bursars are tyros in their art, it will be necessary for the colleges which undertake their training to provide for them considerably longer periods of practice than are generally provided in the case of students who have been pupil teachers. In other words, there will be a reduction of time spent on academic work and an increase in the time spent on the professional side, so our colleges will be expected to adapt themselves to a new environment. As a corollary to this, local authorities who control elementary schools suitable for use as practising schools are reminded that the supply of properly qualified teachers will in future depend largely on their generous co-operation with training colleges, in making these schools available for the purpose. As, however, we are not a

logical people, the Board of Education, having immediately made a rule, begins to arrange for exceptions, and it suggests that those bursars who do not see their way to enter colleges at once may be employed in schools under the supervision of competent head teachers for not more than a year as student teachers.

We shall thus have two streams of candidates flowing into our training colleges: one, fresh and free from any professional taint, from the high school; and another, stained with a year's, or it may be two years' experience of teaching a class in the elementary school. That much will have to be done for the first to make them efficient teachers no one will deny, and it is with these we are taking a leap in the dark. Until the young person has come into actual contact with children, he scarcely realises the responsibilities of a teacher, and he may desire to leave the profession for which he has been chosen and trained, or he may prove very unsuitable for it.

The second class, having had a year's experience, may decide not to enter a training college, and thus commit themselves to a calling which may be distasteful to them in after life. There is a great deal in the daily routine of a school which can only be gained by experience and is not connected with the giving of lessons, and it is quite possible for a man to be capable of giving excellent lessons, and yet to be thoroughly uncomfortable in the presence of a class, and quite unskilled in his management of work throughout the day. The gifts of arranging a day's work, of restraining fast pupils and of driving slow ones, of appreciating modest efforts and of depreciating native boldness, of giving decisions to meet a boy's sense of justice, and of influencing character, these are only cultivated on the spot by attrition, and not in the lecture-room. This is where the risk in the experiment lies, and where the training colleges will have to rise to a high sense of the responsibility thrown upon them. The nation need not doubt, however, that a bold attempt will be made to help the Board of Education, for the authorities in charge of these institutions are more progressive, more alert to the needs of the country, and more desirous of improving the professional standard of their pupils than the general public are aware. The difficulties they have overcome in the past have been considerable, and they have worked wonders with the most unpromising material.

Now let us get to closer quarters with these new people. Some will leave the secondary school at seventeen years of age, and, having passed the preliminary examination for the elementary-school teacher's certificate or an equivalent examination, will become teachers for one or two years for four days a week. On the remaining day they must proceed with such further general education as may be available to the satisfaction of an inspector of the Board. Are they likely to proceed further or to stand still? If they stand still, when they come to the training college at nineteen much of their forgotten lore will have to be recalled, and

we shall have the academic side developed and flourishing, and again crowding out and overgrowing the professional, and to those inside the walls this is a serious risk. It is not undertaken by our Western cousins, for they frankly declare their normal schools to be professional training places only, and no priest or Levite could pass by academic distinctions more unheedingly than they. Of the fourteen examinations named in the list which qualify students to become teachers, half involve matriculation studies. These most naturally and rightly should lead to graduation, and so our new people have as an inducement for further study the ambition to acquire a degree. Will this absorbing and difficult work also allow them to spend much time and energy in prosecuting their scientific training?

The law of the excluded middle tells us that everything must either be or not be, and in practice it works out that a man who is keenly following a severe plan of study will not allow himself to be distracted or diverted from his course by the problems and perplexities of professional training. Modern teaching is much more subtle and scientific than it used to be; it has an ever-increasing literature, it has speculations and ranges of thought beyond the dreams of the early schoolmasters, and its history is receiving the attention of serious students. These things the aspirant for an academic degree must pass by because they do not represent an assessable value to him. Let us hope that the Board of Education will see its way to establish a diploma or certificate which shall have in the educational world a high value, and shall qualify a man for any post in his profession in either elementary or secondary schools, or in the wider fields of superintendence or organisation.

To those bursars who leave the school for the training college, there will be no break in their student life, no acquaintance with the practical things of the future. Only in the margin of consciousness will there be a desire that when their course of study is over, it will be their duty to impart this knowledge to others. Hence the need for long periods of practice and for close contact with child life. This question is not solved by merely throwing open the schools in the neighbourhood of the training colleges, however sympathetic and generous a local authority may be. The modern class-room school is so completely organised that a visiting student cannot acquire much of his art by imparting instruction to a class under the control of the class-master, who naturally takes care that as little time as possible is wasted by his visitor's incapacity. To prevent this admitted defect, in some American practising schools a teacher is placed in charge of two classes in one large room, a student is allotted to each class, and he (or rather she in America) patrols the room while the students are carrying out the daily work of the school. We shall have to guard against our students being side-tracked by zealous masters, and we shall have to devise schemes for placing them in the forefront of the

battle while they are winning their spurs. In the end perhaps it may be a good thing if our teachers become slightly less efficient. May we not do too much for the pupil; are not his difficulties too clearly explained; are not his rough places so smoothed that there is nothing left for him to do but to expose himself to the gentle stream of information so carefully poured upon him, and he will pass through all his grades of learning? So, should this experiment not succeed, the failure will be a blessing if it lead to a stiffening and invigorating of the mental muscles of the human boy.

THE REFORM OF EXAMINATIONS.

By C. M. STUART, M.A.

Headmaster of St. Dunstan's College, Catford, S.E.

THE London division of the Incorporated Association of Headmasters has adopted the report—printed on p. 225 of the present issue—drawn up by a sub-committee, containing suggestions for modifying the L.C.C. Intermediate Scholarship examination.

The general recognition of the principles enunciated in this report would produce a very considerable modification in the practice of examining bodies generally. In the past, such bodies, partly with the laudable intention of making their methods as public as possible, but also partly with the idea of saving themselves trouble, have laid down very definite and precise rules as to what subjects and subdivisions of subjects each candidate may take; what percentage of marks is allowed for each subject, even for each question; what periods in history, what books in literature, what experiments in science the candidate is recommended to "get up." The idea that a candidate should be encouraged to read generally, and to show in the examination not only his knowledge, but his originality, is entirely absent from the syllabus of most examinations.

At present boys are not educated; they are "prepared for examination." If the examinations were conducted on proper principles, if they were wide enough in their scope, if they were unfettered by marks, if no special books were set, and if general study were more encouraged, preparation for examinations would become obsolete. The proper examination is one which a boy can take "in his stride," that is, without special preparation, and there are but few examinations which approximately fulfil this condition.

But, it may be objected, the wide method of examination which you recommend is all very well for the advanced boys who enter for university scholarships, but it cannot be adopted in the case of young boys whose knowledge is more limited. Very well; then the moral is, not that a precise and rigid syllabus should be published for examination, but that the examination should be abandoned: an examination which cannot be conducted on the best lines should be discontinued altogether; and if those intelligent bodies who hold competitive examinations and give honour

certificates to boys under sixteen, or even under fourteen, would only realise the enormous harm they are doing—but that is another story.

The L.C.C. intermediate scholarships are intended for boys of from sixteen to seventeen years of age; that is, for those whose school career will shortly end, and who anticipate utilising their scholarship to take them to some college or institution of university rank. Such boys may not unreasonably be supposed to have chosen their special subjects of study, and the examination should be such as to select those who show promise in the subject chosen; it should, in fact, encourage special aptitudes.

Now the notion of specialisation appears to be anathema to the great majority of schoolmasters, and to all educational authorities. "A good general education" is the shibboleth which is used to crush all attempts at developing originality. It was under the name of "a good general education" that we at Harrow (in the seventies) had twelve hours' Latin and ten hours' Greek in a twenty-four hours' time-table. It is after receiving "a good general education" that boys of fifteen and sixteen are sent to us now, who have never done any science, and have never heard of practical arithmetic, and it is probably under the idea of "a good general education" that the present L.C.C. intermediate scholarship examination insists on a general hotchpotch of small subdivisions of elementary subjects, single poems or plays by way of literature, limited periods in history, and individual experiments in chemistry.

The boy who obtains a scholarship on this work is usually very plodding, very diligent, and conspicuously devoid of originality; he will produce exquisitely written and laboriously prepared essays and notes, but he sits silent in conversational modern language classes, and when he is asked in science classes, "What do you learn from this?" replies, or thinks, "How can I tell? I've never done it before; but if you'll tell me, I'll take good care to remember it." We once heard it expressed, "the boy who gets an intermediate scholarship is not the sort of fellow with whom you would care to be cast on a desert island."

Far from discouraging specialisation, we believe that the chief duty of the schoolmaster is to look out for any special aptitudes or instincts in his boys, and to encourage them to the utmost. Such special aptitudes are not common, but when found they generally mean genius, only the specialisation must be developed on rational lines. The specialisation which is encouraged by the present system of examination is altogether on too narrow lines. A boy of seventeen might be reasonably expected to have read, not only the history of his own country, but some of the general history of Europe; our history scholar is, however, now limited to one particular period of one country.

The objection has still more force in the science division; a boy can get a scholarship in science

on chemistry and mechanics, and remain absolutely ignorant of heat, light, sound, and electricity. Further, in chemistry his knowledge of volumetric work may be limited to the measurement of acid and alkali. A parallel regulation would be that in an examination on the geography of England all personal observation must be limited to the Ripley road.

Another innovation that is recommended in the report is the secondary value assigned to marks. Marks are good servants, but bad masters. A list of the marks gained by a set of candidates on a single paper assists an examiner to remember and to see at a glance the comparative merits of the candidate on that paper; but a comparison of the marks in dissimilar subjects has no value at all, and when candidates have to choose their subject according to value of marks assigned, the thing becomes preposterous. To take the place of this the committee recommends that no limitation should be placed on the number of subjects offered, and it anticipates that candidates will devote themselves especially to *cognate* subjects; the mathematical candidate will take not only pure mathematics, but also applied mathematics and experimental mechanics, with probably some physics; the scientific candidate will take chemistry with all branches of physics and some applied mathematics; the linguistic candidate will take any languages, ancient or modern, which he has had the opportunity of learning.

When the examiners in each of the three divisions meet, after looking over the papers, each examiner will keep his own marks to himself, but the question before them will be: "What candidates show style and promise? What candidates have shown that they can not only reproduce, but think in their subject?" It is believed that superior intelligence will be readily recognised, whether a candidate has entered for two papers or for six, quite irrespective of his total marks.

It may be objected that such an examination would involve much greater work for the examiners; well, if it is to make a better selection there is no great harm in that, but it must be remembered that far too many candidates have been compelled to enter for this examination in the past. The County Council has apparently been of opinion that every one of its scholars requires to be examined, and that any examination will do. Junior scholars are compelled to enter for intermediate scholarships who have no more chance of obtaining one than of becoming archangels. A junior scholar once said to his headmaster: "I want to remain at school until July, but to do so I must promise to enter for the intermediate. I know I've got no chance of getting an intermediate, and I wouldn't take one if they were to offer it, for I've got a good post in an office promised to me in September, and I want to get on with my shorthand and modern languages." "All right," said the headmaster, "you have got to enter for the exam., but as you have not got to pass it, you need not do any work for it, and it doesn't matter how you answer

the papers, so there is no necessity for you to join the special classes preparing for it." What an absurd waste of a boy's time and an examiner's work! We do not enter a boy for a university scholarship unless we think he has a reasonable chance of obtaining one, and the intermediate scholarships should be regarded in the same way.

Turning to the special recommendations on science, it is seen that the committee lays stress upon a broad foundation of scientific knowledge; as successful candidates will probably specialise in science at colleges of university rank, general chemistry and general physics are essential. The statement in the report that "boys are kept for two years studying chemistry to the exclusion of physics, or electricity to the exclusion of other science," has given rise to much discussion. It has been said: "Surely schools do not limit a boy's work solely to the requirements of an examination, but insist on all branches of science being taken, whether required for examination or not?" This question each master must answer for himself. We believe that schools do very largely confine their work to examination requirements, but the point is not so much what schools do, as what the L.C.C. encourages them to do. Further, a boy approaching seventeen may not unreasonably be supposed to do some private reading in his favourite subjects, and he cannot be expected to keep up his reading in the subjects which he is not taking in the examination.

The limitation of the syllabus in chemistry, and especially of the volumetric work, has been already mentioned. It is an evil inseparable from the production of a precise syllabus. The compiler desires that he may not be accused of introducing too much, and yet he sees the importance of volumetric work, so he introduces one volumetric experiment, and the study of three metals. A precise syllabus of this kind for boys of seventeen is a mistake; science masters must be encouraged to carry clever boys as far as they can go without this limitation of experiments.

The committee recommends an oral examination in science, and it anticipates that this may some day replace the practical. Practical examinations in science are never satisfactory; the essence of good practical work is that there must be no hurry; but all examination work is done against time; the candidate is usually in a strange room with strange apparatus, and all surroundings conduce to his being flurried. Further, success in practical work, especially with inexperienced candidates, depends very often upon flukes. To take a simple instance: a frequent question is to ask a boy to dissolve a metal in acid; success in this depends wholly upon the dilution of the acid; if too strong, it froths over; if too weak, it does not dissolve in time; there is not time, and sometimes not apparatus, to make three or four different experiments; consequently it is very largely luck whether the correct strength of acid is hit off the first time. Practical examinations are a survival of the days of qualitative analysis; now that all work is quantitative

they are out of place. A boy must be taught practically, but examined on what he has learnt.

In suggesting that the students' note-books would afford a basis for an oral examination, the committee does not consider that the note-books should be marked for the examination. The examiner would merely utilise the note-books as a means of ascertaining what the candidate had done, and how far he understood what he had written; his questions would not be confined to the note-books, but he would have the opportunity of learning how far a boy was able to apply the reasoning from experiments which he had done to new problems. The principle of taking note-books as a basis of examination or inspection, and questioning the boys, orally or in writing, upon the experiments set forth in them, is cordially recommended to all examiners and inspectors.

The recommendation to discontinue the examination in elementary experimental science is of the greatest importance, and will probably give rise to many different expressions of opinion. We have heard it said that if boys are to do a subject, what can be the harm of requiring an examination in it? Now, we consider that every boy should go through the course of elementary experimental science, but that an examination in it is harmful for the following reason, viz., the course of elementary experimental science was intended to teach *principles*; the examination requires *details*; and we hold that a boy may have gained the full benefit from such a course although he has utterly forgotten the experiments therein. There are few subjects more delightful to teach to boys of twelve and thirteen: in studying it, they are being introduced to a new world; in working with their own hands, and taking their own notes, they are beginning to feel themselves persons of importance. On the other hand, there is no subject so dull for older boys to get up for examination: the work contains nothing new for them, all interest in the results of experiments has long since departed, the principles are perfectly familiar, but master and candidates grind along the weary round of describing experiments suitable for younger boys, of learning to recognise that the same question may be asked in half-a-dozen different ways, and of devising laborious experiments to prove something which is perfectly obvious.

The same argument applies to most examinations in elementary science; those who have had to grind over and over again at the science for the London Matriculation know what deadly drudgery revision of scientific work becomes. Most boys will take an interest in new experiments, or even in old ones repeated for more complete observation, but no one can take an interest in revision of elementary work. The scientific boy wants to get on to something higher; the literary boy prefers his own subject.

We have even heard it suggested that the farsighted gentlemen who have insisted upon the retention of Greek in the Cambridge Previous are going to prove their broadmindedness by pro-

posing the inclusion of compulsory elementary science. The gods forbid! We have been up with pleasure to vote against compulsory Greek, but we'll go up, if we have to walk the whole way, to vote against compulsory science: for scientific candidates it is unnecessary; for literary ones it is—that is, an examination in it is—drudgery of the worst kind.

THE USE AND MISUSE OF "UNSEENS."¹

By Prof. G. G. RAMSAY, LL.D.

THE importance attached in Scotland to examinations in unseen work as contrasted with prepared books is quite recent. It dates from the establishment of the present severe preliminary examination for entrance to the universities, which is entirely in unseen work. What has been the effect upon classical teaching of that examination? It has been palpable and admirable. A high standard for admission to the universities has been set up, and in consequence the standard of examination for the degree has been raised in all the old subjects of the course. But what has been the effect upon the classical education of the country, and upon the teaching given in the schools, of making the entrance to the university, so far as languages are concerned, depend entirely upon Grammar, Unseen Translations, and Composition, to the exclusion of prepared books, and of any questions to test a knowledge, however elementary and general, of the history, the life, the literature of ancient Greece and Rome? While highly satisfied by the results of the grammar and composition parts of the preliminary examination, I feel doubts as to the wisdom of confining the translation part of the examination entirely to unseen books.

THE TEACHING OF CLASSICS.

If there is one thing more than another that has been brought out in recent discussions on classical education, it is that if the classics are to keep their hold upon the nation as a main instrument of higher education, it must be by making the teaching of them more real, more living, and less technical than it has tended recently to become. We do not want our boys to study Latin and Greek as linguistic puzzles; we wish them to study classics partly as an introduction to the principles of language in general, and as a potent help towards obtaining a mastery of their own tongue, or of any other they may have to learn; but also, and still more, as an introduction to the great central facts of human life and thought, of history and literature. These facts can be studied most fruitfully in connection with ancient Greece and Rome, because they are there presented in simple fundamental forms, unencumbered by the mass of detail, untainted by the introduction of the many party questions,

which make the study of modern life at once more difficult and less illuminating for the young mind. Therefore both at school and at the university the great classical authors have to be studied as much for their matter as for their form. The real education to be gained from any great classical book is gained by mastering its contents, understanding its ideas and allusions, knowing what is to be known about the persons and places mentioned, comprehending the scope and the occasion of its being written, and thus learning to appreciate the beauty of the language and to feel what literature means. For the above purposes, careful study of books as a whole is essential; and any examination which fails to bring out whether such a study has been given or not fails in its essential educational object.

How far, then, does an examination consisting of unseen passages for translation provide such a test? My answer is that it depends largely upon the stage of proficiency reached by the pupil; more largely still upon the question whether such an examination has been made the be-all and the end-all of the teaching which it professes to test. When a really high standard of knowledge has been reached, unseens are admirable. No other test can be applied (alongside of composition) to discover whether or not a candidate possesses a finished knowledge of the niceties of a language; no other test throws the candidate so entirely upon his own resources. Hence it is used in all the highest university and Government examinations, whether in ancient or modern languages. But in examinations of this higher grade, an Unseen *does* bring out and test knowledge which can only have been acquired by a previous thorough study of many books. No candidate can face an examination for an open university scholarship of the first grade without having read widely and read carefully. In such examinations the candidate must show, in every piece that he translates, that he understands the meaning and bearing of the passage, its allusions, its argument, its literary and historical setting; if he fails to do this, he will fail to give an excellent translation, and to secure a high place. A good examiner has no difficulty in discovering whether a translation is composed of a series of happy or unhappy guesses, or is based upon a trained acquaintance with ancient life and literature.

But at an earlier stage of development the case is very different. It is of no use to set a boy down to a piece of unseen translation unless he has read enough in the same kind of style, and in the same kind of subject, to enable him more or less successfully to make his way through the whole. The teacher ought to make sure, before setting an unseen, that the pupil has material enough in his mind, and training enough in the language, to enable him to cope with it from his existing knowledge; and then the exercise is in the higher degree wholesome and stimulating. But it is a fatal mistake to put before a boy a mere puzzle, which he has not the material in his brain to deal with: it is not fair to set him to a hopeless task; to do so

¹ From a paper read at the spring meeting of the Classical Association of Scotland.

encourages that disastrous habit of making shots, and random guesses, which is destructive of sound and steady progress, and leads to forming habits of inaccuracy. I have had to look over unseens in which there was not one word of sense from beginning to end. The true method of teaching in all subjects is to lead the pupil gradually on from step to step, explaining what is new, and encouraging him to make fresh steps for himself in a region where things have been already made plain to him. In the same way, unseens should be introduced gradually, in proportion to the amount of reading, and the kind of reading, which the pupil has gone through. His mind will be braced by feeling that he has a problem before him which is within his strength; whereas nothing is so discouraging for him as to feel conscious that he has not within him the means of solving the difficulties put before him.

THE PROPOSED CHANGE.

In the probable reform of university arrangements, I should feel disposed to recommend a change which, without restoring the plan of setting definite portions of definite books to be prepared, might yet encourage scholars to read the best authors in the best way. It might be announced each year that the translations would be taken from certain considerable portions of certain authors. The portions named should be too large to admit of being crammed; and the definition of the subjects would secure that considerable portions of such authors were read and read carefully. I would introduce also general questions in history, antiquities, and literature, quite of a general and easy kind—and with ample alternatives—so as to make sure that the authors read should have been read not merely as exercises in language, but as an introduction to the real life of ancient Greece and Rome. I repeat that unseen translations are an excellent exercise for senior and honour students, and indispensable in honour examinations; but they should be used sparingly for pass men, and still more sparingly in the ordinary curriculum of schools. Just as it is premature to ask a boy to write an essay until he has got something in his head to say, so to put an unseen before him which goes beyond his reading is to ask him to make bricks without straw.

I could give amusing and even instructive examples to show how often students who have passed even the Higher Preliminary have chaotic notions of the principal events, personages, and places ordinarily encountered in the classics. I once had a class only one member of which could tell me what was a Tribune of the Plebs. One told me that Tarquin, Spurius Maelius, and Manlius were all killed in the wars of Julius Caesar; and even after reading Horace for a session, students have informed me that Tempe was a watering place in Italy, that Aufidus betrayed the Romans to Jugurtha, that Patareus was one of the giants who rebelled against Jupiter, while another converted him into a Sicilian promontory. Indeed, I might sometimes have constructed a tolerably

complete map of Italy out of the answers to a single proper name, which has been explained by various writers to be a province, a river, a mountain, a town, or even as the name of Horace's favourite young lady. It is very discouraging to find that when a student comes across a word printed with a capital letter, he should hold himself relieved of the responsibility of finding out anything about it at all. Proper names are often thus regarded as negligible quantities; and at every step the appreciation of an author is interfered with by ignorance of elementary facts of history, geography, mythology, all of which might easily be learned at school.

Some instances of the difficulties caused by examinations of this kind to candidates who have not been well grounded in the language are quite pathetic, and instructive also. One candidate not long ago was in sore tribulation. He had been rejected no less than four times for the Preliminary; and the hard thing was, according to his own account, that it was entirely a matter of ill-luck. He had carefully studied previous papers; and going on the law of averages, like scientific players in the gaming-rooms of Monte Carlo, he had each time made up his mind what kind of passage was going to be set next time, and had prepared accordingly. But by a continuous run of bad luck, whenever he had got up all the proper words and phrases for a military piece, a political piece was set; if he got up all possible philosophy or oratorical terms, some homely anecdote in ordinary life was set, with no philosophy or oratory in it.

"Would you never then give unseens at school at all?" it may be asked. By no means; but I would remember that they are mainly for the best scholars in a school, the honour scholars so to say—and that rather as a test of how far a scholar has got, than as a means of instruction. I would never give to a pupil an unseen that was beyond his powers. I would not have him prepared specially for doing them. Like happiness itself, the power to do unseens comes most surely to those who have worked honestly, but without having that particular object in view.

How to Study Wild Flowers. By the Rev. George Henslow. Pp. 235+12 double-paged coloured plates and 57 other illustrations. Third impression with appendix. (Religious Tract Society.) 2s. 6d.—With the aid of this volume a student can not only become familiar with the majority of the commonest of our wild flowers, but also with the structure and functions of the various parts. Unlike numerous popular books on natural history, in which the descriptions consist largely of sentimental sayings and vague impressions of no educational value or biological significance, this volume aims at training the young naturalist in habits of critical observation and accurate expression. Mr. Henslow shows how flowers should be studied thoughtfully, and not merely contemplated as interesting objects in nature. His book is capable of establishing a sound and useful foundation of botanical knowledge in the minds of all who use it rightly.

THE TEACHING OF COOKERY.

By A. SMITHILLS, F.R.S.

Professor of Chemistry, University of Leeds.

WITH the object of directing "attention to the really inefficient character of much of the cookery instruction now being given to our elementary-school children, and of demonstrating how radically bad are the methods of organisation enforced by various local authorities," the Board of Education has recently issued a Special Report upon Cookery Teaching in Elementary Schools and upon the work of the Training Schools for Cookery Teachers.

It is perhaps as well to let bygones be by-gones; otherwise it might be instructive to inquire how far the state of affairs which is so roundly condemned is not attributable to the fact that until quite recently the resources at the Board of Education for organising and supervising the teaching of domestic subjects have been of the most meagre kind. This report might, in fact, be regarded as in no small degree a judgment by the Board on its own neglect. However, there is no doubt that the Board is now earnestly bent upon the object of securing the efficient teaching of cookery in our elementary schools, and it is better to rejoice for the future than to weep for the past. No one who has any knowledge of the homes of the poor, no student of physical degeneration and other social evils is likely to underestimate the supreme national importance of the adequate teaching of what are called domestic subjects. It is no exaggeration to say that nothing secular, no Acts of Parliament, no contrivances of philanthropists are so calculated to ameliorate the condition of mankind as a system of teaching which will make women competent to manage their homes.

The defects in the teaching of cookery which are revealed in the report are exactly what one would expect in connection with a subject which has been treated contemptuously as being without the pale of polite learning. A lower order of intelligence in the teacher, poor preliminary education, inadequate training both in theory and practice, no adequate appliances in the school, no adequate endowment, time-table difficulties in which cookery has been sacrificed to some more valued subject—these are the complaints. They are illustrated by examples, sufficiently humorous in some cases to have given the report currency in the daily Press.

We may hope for better things; the language used by Mr. Morant in an admirable prefatory memorandum, the whole tone of Miss Lawrence's remarks, the recent additions to the inspectorate, leave no doubt on the subject.

There is, however, one aspect of the teaching of cookery to which I think justice is rarely done, and to which justice is not done in this report, and that is the intellectual side. People do not seem to realise how much can be taught *through* cookery. I do not mean tidiness, accuracy, vigilance, and other virtues of the kind, but good

mental habits. A celebrated artist declared that he mixed his colours with brains, and in no less degree is it possible for a good cookery teacher to mix her dishes with brains. It would be difficult to find any species of human activity where there is more ignorance of the relation of cause and effect, or one where the powers of independent judgment and thought are more constantly suspended, than the practice of the household arts. The reform must come through the teachers, and I am convinced that it will not come unless a very considerable amount of scientific training is infused into their curriculum. But it must be science of the right kind, and not of the kind that is still commonly attempted. I cannot develop this subject within the space at my disposal, but I mention it because Miss Lawrence's report contains words which might very fairly be construed into a disparagement of the scientifically trained teacher. She wishes "to emphasise the fact that speaking generally the practical rather than the scientific teacher is found, by experience, to be unquestionably the better suited for teaching children in our elementary schools." I accept the judgment, but I should have been glad to see an admission that this result is no argument whatever against scientific training of the right kind. It is sure to be used as one, notwithstanding the succeeding words in the report, which are but an unconscious demand for scientific training. "The reports from many, even of the most efficient training schools, indicate that the methods are too stereotyped; when the students have to act on their own responsibility, they seem wanting in common sense, and their work is frequently disappointing."

The intellectual realm that surrounds cookery is science; the kitchen is a place where the method of science, that is, "organised common sense," should prevail, even if much formal scientific information be not there, and any suggestion that science is the enemy of practice, coming especially from a Department of the State, is, I think, to use official language, "a regrettable occurrence."

Apart from this, I feel that the report is one calculated to do good. It is censorious, and is perhaps a little unkind to teachers who have had to work under conditions for which they were not to blame, but it gives the promise of a more fostering care on the part of the authority which is ultimately responsible.

A Text-book in General Zoology. By Henry R. Linville and Henry A. Kelly. x+462 pp. (Ginn.) 7s. 6d.—The student who reads this book carefully will obtain well-balanced and accurate ideas of the main facts of animal structure and physiology, and of the more important aspects of biological speculation and research. The field is, of course, too large to admit of much detailed description in a volume of this size; but in an elementary text-book of zoology breadth of view is of more value than description of facts which can only be studied satisfactorily in the laboratory. The book is beautifully and copiously illustrated by drawings and reproductions of photographs.

THE NATURAL HISTORY OF ANIMALS.

HOW TO TEACH THE NEW SUBJECT OF THE CAMBRIDGE LOCAL EXAMINATIONS.

By OSWALD H. LATTER, M.A.
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II.

THE previous article¹ was, for the most part, concerned with the invertebrate animals named in the examination syllabus. We will now consider the back-boned.

Candidates for the junior certificate are expected to have knowledge of:

(1) The general structure of a mammal. The important characteristics, as regards form and habits, of the following mammals: monkeys, bats, moles, hedgehogs, carnivores, ungulates, whales, rodents, marsupials.

(2) The anatomical features peculiar to birds, and their adaptation to flight. The principal diversities in external form and habits characteristic of the main groups of birds. The eggs, nesting and singing habits, and migration of common British species.

(3) The life-history and habits of a frog.

(4) The external features and mode of life of a fish.

Senior candidates are liable to more advanced questions on the above, and are further to be acquainted with "the main features of the external form, habits, and life-history of the common British species of fishes, amphibians, and reptiles."

Now it is at once obvious that for several reasons large portions of the above list cannot be dealt with in quite the same direct manner as was advocated for the lower animals. Monkeys and marsupials are not readily accessible, nor are whales convenient subjects for observation in class-rooms of the usual dimensions. Moreover, most of our indigenous mammals, if tolerant of captivity, do not exhibit themselves at their best in broad daylight and in the presence of an inquisitive crowd. For knowledge, then, of the habits of several mammals recourse must be had to books and lectures, but these should be supplemented by visits to zoological gardens and to good museums, if possible to the Natural History Museum at South Kensington. And here I would add that such visits should be really for study, not mere vacant, purposeless wanderings in courts and galleries; but undertaken with all the seriousness of a class-room lesson for the sake of gaining a clear appreciation of some one or two animals, or the modifications of form exhibited in relation with habits. It is a mistake to attempt more than a very little at any one visit, or to dream of "doing" the whole museum in a few short hours.

For reasons stated in the former article, it is advisable to begin this section of the work with Man as the type of mammal, and to proceed down

the scale, rather than to adopt the natural order indicated by evolutionary ideas. At this early stage it is surely best that the facts which ultimately demand and compel acceptance of the theory of evolution should be firmly grasped: later they will become part of the solid foundation on which the superstructure can safely be erected. Moreover, it is perfectly clear from the terms of the syllabus that the more philosophical aspect of zoology is not, and rightly not, here contemplated. A further argument in favour of this order lies in the undoubted fact that frequent reference to, and comparison with, human organisation, adds greatly, particularly at this early stage, to the interest aroused. But here let me add a word of protest and caution: the terminology of human anatomy is heavily loaded with the technical terms in vogue with students of medicine; a large number of these terms are absolutely unnecessary at this stage, and some are actually misleading, at any rate when applied to animals which do not stand "erect and tall." For example, in dealing with vertebræ, we can well dispense with such terms as "zygapophysis" ("zigopophysis") I recently found it in a paper sent up by a candidate in an examination of similar standard), and substitute the more lucid expression "interlocking piece": and wherever the medical books print "anterior" and "posterior," insert "ventral" and "dorsal" respectively. It is a mere accident that man walks with his ventral surface directed forwards instead of horizontally and downwards—nor does he do so throughout life. It adds much to clearness if we orientate man in the same way as we do his humbler relations, and we then get our terms on all fours right along the line.

External characters will, of course, be the first to occupy attention, and it will be natural to begin with the skin and its covering. A few questions will soon lead pupils to the conclusion that hair is as characteristic a clothing to mammals as are feathers to birds. The modifications of the form of the limbs as a whole, and of their claws, hoofs, or nails, can to some extent be made out from the entire animal in the flesh, but it will be necessary to see skeletons (or good pictures of some of the less accessible) in order to obtain a clear understanding of the relative positions and proportions of the bones concerned, and an appreciation of the modifications that take place in corresponding parts according as the organ is used for walking, flight, grasping, swimming, and so on. The form and disposition of teeth may fairly be included among external features, and for this purpose perhaps teeth, or whole skulls of a cat, horse (or cow), hedgehog, and rabbit will be sufficient for comparison *inter se*, and with those of man. It need scarcely be pointed out that the nature of the food must be simultaneously considered.

Among internal structures the "back-bone" should be assigned the place of honour. There should be no difficulty in securing vertebræ for every pupil to handle and draw, so that the

¹ Appeared in THE SCHOOL WORLD for May, 1907.

general plan of the architecture, and the mutual relations of one vertebra to another, may be understood. Much interest, however, is added if the mechanical arrangements of the several regions of the vertebral column are noticed. I do not know an elementary text-book in which attention is called to the manner in which the neck vertebræ, while permitting much flexibility of the neck as a whole, are so interlocked as to render dislocation very difficult; or, again, how another contrivance for the same purpose is found in the region of the loins, while in the thoracic (dorsal! *apud medicos*) there is no such security, but displacement is prevented by the powerful arched buttresses afforded by the ribs. And yet these facts are within the compass of children, and vividly appeal to their minds. Again, no text-book omits to point out the extensive fusion of vertebræ that is so striking a feature in the "back-bone" of birds; but how many direct attention to the need for rigidity in a back that is nearly horizontal, and is supported near one extremity when the bird is on its feet, but near the opposite extremity during flight? Or how many note the inclination of the coracoids towards one another at their junction with the breast-bone, an arrangement by which the thrusts of the two wings are caused mutually to oppose one another? I cannot do better than mention in this place Mr. Headley's book, "Life and Structure of Birds" (Macmillan). I pass over the details of circulatory and digestive systems with the recommendation that these should not merely be learnt from books, but a specimen should be seen dissected, or, better still, be dissected by the pupil himself.

The paragraph in the syllabus dealing with the main groups of birds, I take to imply not the scientific and systematic classification of birds based upon the entire anatomy, but rather those features of beaks and claws which are so intimately associated with habits. I refer to the shape of the beaks and feet of birds of prey, swimming, wading, perching birds and the like. The knowledge of eggs, nests, songs, and migration can only be profitably or permanently obtained by open-air study.

The difficulty of direct observation of the living animal disappears when we come to the cold-blooded vertebrates. Our British snakes and lizards, our frogs, toads, and newts, and some at least of our fresh-water fishes, thrive satisfactorily in captivity, so that their habits and actions can easily be watched. The dictates of prudence will probably forbid the inclusion of the adder in the vivarium, but the grass-snake is quickly tamed and will tolerate handling without becoming offensive; the smooth-snake (*Coronella*) is so rare that we may here leave it out of account. Slow-worms, both species of lizard, the frog, the common toad, the natterjack toad, and all three species of newt can be obtained in many parts of the country and reared with comparatively little trouble; while of fishes the minnow and the stickleback will be the most convenient for small aquaria.

In these as in the warm-blooded animals, the

distinctive characters of the skin should be noticed, and also the form and disposition of the limbs, noting the suppression of the latter in snakes and slow-worms, together with the manner in which locomotion is accomplished. The mode of breathing and the movements by which it is carried out are worth close-attention, particularly in the frog and toad. In some respects the toad is a better animal for observation than the frog; the former is more deliberate and docile, and will soon consent to take food from the hand, so that the action of the tongue in seizing the prey and of the eyeballs in the act of swallowing can be noted. On the other hand, the colour of the toad's skin is far less susceptible to change than that of the frog; hence the latter should be used to show how the disposition of the integumentary pigments is adjusted to suit the surroundings. This experiment may be performed as follows: take two frogs as alike as possible in the coloration, place each in a separate glass jar containing water to a depth of half an inch or so (large preserving jars made of clear glass answer the purpose well enough; the water is for the comfort of the animal); beneath and outside the back and sides of one jar put sheets of dull black paper; the other jar should be treated in the same way with white paper; one side of each jar should be left uncovered by paper, and this clear side should be turned towards the window, care being taken that the sun shall not shine upon the vessels or their occupants would suffer. If this be done in the early morning, a very marked difference in the colours of the two frogs will be visible by the afternoon; that surrounded by black paper becoming very dark brown, the other pale greenish-yellow. I have often been able to detect a decided change after the lapse of one hour only. Somewhat similar experiments with caterpillars and chrysalids, if for a moment I may hark back to the previous article, yield most interesting and instructive results, and may be made to add largely to the value of rearing insects.

The opportunity of watching vertebrate development as exemplified in the frog should certainly be embraced. The spawn of frogs and of toads can be procured in the spring from any country district, and is not seriously injured by a short journey. Small masses containing about a dozen eggs can be kept successfully in shallow vessels of water, such as large saucers and pie-dishes; and with the aid of an ordinary hand-lens many of the developmental changes can be noted from day to day. When the tadpoles emerge it is best to transfer them to rather larger vessels containing more water and also a plentiful supply of water-weeds, which serve both to keep the water well supplied with oxygen and to feed the animals themselves. Easter holidays have an unfortunate way of interrupting the observations of this life-history, so that arrangements should be made to secure the preservation in formalin or in alcohol of average examples of the stages reached during this period; or, better, the children should

obtain specimens and keep them under observation at their homes. It will be necessary as the summer advances to provide some means by which the tadpoles, or other young frogs, may leave the water and take to *terra firma*; though it is possible, and an interesting variation on the normal course of events, to prolong the tadpole-condition for many months; in fact, I have seen a tadpole of two years of age—a quaint creature suggestive of a man in an Eton jacket, but not devoid of zoological interest.

It will be convenient and natural to refer once again to the whales when the course of teaching reaches the fishes, to work out in detail the points of resemblance in bodily form and to direct attention to the differences in the plan of the tail and in the internal, skeletal arrangement of the fins. A visit to the Whale Gallery at the South Kensington Museum will at this point be very helpful.

For the sake of those who may have difficulty in procuring specimens, I conclude by giving the address of Mr. T. Bolton, 25, Balsall Heath Road, Edgbaston, Birmingham, from whom many fresh-water and land specimens can be obtained; the Director of the Marine Biological Association, The Laboratory, Plymouth, for marine life; and Mr. R. J. Brogden, 28, Colville Square, London, W., for skeletons and museum specimens.

TEACHERS' NOTES ON BRITISH HISTORY, 1688-1906.

By C. S. FEARENSIDE, M.A. (Oxon.).

III.¹—PRUSSIA, AMERICA, INDIA, 1748-1783.

THE essential point of the period we now approach is this: how the deep-rooted rivalries of Habsburg and Hohenzollern in Central Europe, and of Guelf and Bourbon in the West—rivalries which did not indeed originate in the so-called "War of Austrian Succession" (1740-8), but which then, after a lull, revealed themselves with a violent and bitter intensity—developed and expressed themselves, sometimes in close connection with one another and sometimes almost in isolation, during the crowded half-century that elapsed between the *Peace of Aachen* and the outbreak of the French Revolution. These international—or rather inter-dynastic—rivalries are directly connected with the great constitutional features of the period: namely, the rise of a group of philosopher-kings or enlightened despots, bent on making their governments efficient—partly, at any rate, with a view to becoming better armed against their neighbours—and the foundation of an English-speaking federal republic in North America.

Our period falls naturally into four divisions of very unequal length, importance, and interest, but each with a marked character of its own. We

begin with one of the least eventful periods in British and European history (1748-54); then follows the Seven Years' War (1756-63), in which the various continental, colonial, and commercial quarrels become almost inextricably intertwined for a few years, and ends in the decided triumph of the short-lived Anglo-Prussian alliance; the seventh decade of the century is mainly occupied with domestic struggles and reforms; and, finally, in the two following decades we have a period of partition and dissolution—in which the kingdom of Poland begins to be devoured by its bigger neighbours, with the connivance of the Western Powers, and the British dominions are partitioned—speaking prophetically, one might almost say "bisected"—by the successful revolt of the older British colonies in North America.

In the period marked by these outstanding events, by far the most outstanding personality is Frederick the Great; and round him may conveniently be grouped not only the neighbouring monarchs with whom he came most into contact—Elizabeth II. and Katharine II. of Russia, Maria Theresa, Archduchess of Austria, and her impetuous son, the Emperor Joseph II. (three of whom are briefly treated in Messrs. Macmillan's "Foreign Statesmen Series")—but also the French Ministers, Madame de Pompadour, Choiseul and Vergennes (best studied in Perkin's "France under Louis XV."). For a very short time Frederick II. was working in close co-operation with the only home-staying British statesman of the day worthy to be accounted his peer—William Pitt the Elder, afterwards Earl of Chatham; and with Chatham may be grouped his direct or indirect fellow-workers, Clive, Lawrence, and Munro in the East, Hawke, Boscawen, and Wolfe in the West. Within the political sphere during our present period there were only two Englishmen whose characters and achievements lift them to the plane of Chatham; and their work, though done outside the British Isles, was closely connected with Chatham's. George Washington, perhaps the most faultless great man in all history, undid Chatham's work in uniting Eastern North America under the British flag, but continued and confirmed his work so far as it concerned the maintenance of the English language on that continent; and Warren Hastings manfully preserved British influence in India, from both native and European assailants, during the War of American Independence. From a twentieth-century standpoint, these three magnitudes—Pitt, Washington, and Hastings—and their imperial achievements completely dwarf the eminent politicians and the parliamentary wrangles which bulk so largely in the gossip and diaries of the day and even in the manuals of our own time. In order to appreciate the difference between the parliamentary and the imperial standpoints one should read side by side Macaulay's brilliant essays on Walpole and the elder Pitt and Seeley's illuminating lectures on "The Expansion of England."

¹ The second article in this series appeared in THE SCHOOL WORLD, March, 1907, p. 200.

A. British History.(i) *The Pelham Peace, 1748-54.*

(1) Henry Pelham's Rule, marked at home by little else than the Calendar Reform and Hardwicke's *Marriage Act*.

(2) In INDIA the Second War in Coromandel proves the making of Clive and the undoing of Dupleix.

(iii) *Seven Years' War (Colonial), 1755-63.*

(1) CAUSES: Anglo-French struggle in America for *hinterlands*, in India for *spheres of influence* (to adopt useful modern terms for very old motives). Persons: Duquesne, Braddock. Map-work very important (Great Lakes and Ohio valley).

N.B.—The dramatic events of 1756-7 (Black Hole and Plassey) have but an incidental connection with the Anglo-French struggle in India, which was fought out further south.

(2) BRITISH MINISTERIAL CHANGES, 1754-7: highly illustrative of the constitutional methods and facts of the day. Persons: Newcastle, Devonshire, Henry Fox, Pitt.

(3) PITT'S POLICY: pay Frederick to keep France busy in Europe while the admirals and generals he inspired defeat French at sea, in Canada, and in India. Contrast 1758-62 with 1756-7. Persons: Wolfe, Hawke.

(4) GEORGE III.'s ACCESSION brings in its train the fall of Pitt, the ruinous desertion of Prussia, and grant of comparatively good terms to France and Spain at the *Peace of Paris*, Feb., 1763.

N.B.—Compare similar influence of party-changes at Utrecht; and note that in each case the fact that the war was not concluded by a single treaty, but by several, illustrates the essential non-unity of the preceding war.

(v) *Restoration of Kingship, 1760-75.*

(1) GEORGE III.'s IDEALS: to exercise in his own person the duties and powers ascribed by law to the King (cf. Blackstone's "Commentaries," 1765), and especially to be the master of his ministers ("servants"), not their tool; *patria*, not *party* (cf. Bolingbroke's "Patriot King").

(2) SEARCH FOR A MINISTER, 1760-70: qualities and defects of Bute, Grenville, Bedford, Rockingham, Chatham, Grafton, and North. For personalities and intrigues read Walpole and Junius; for principles at stake read Burke's "Present Discontents." Distinguish Wilkes questions.

(3) CRITICAL CONDITIONS OF 1768-70: Lorraine, Corsica, Falkland Isles, Cook, Wilkes, Parliamentary Reporting.

(4) COLONIAL CONTROL: assertion of central authority leads to taxation of American Colonies (stages and motives on both sides) and to *Regulating Act of 1773*: highly complicated questions which bear directly on the Imperial Problem of our own day.

(vii) *American Revolution, 1775-83.*

(1) COURSE OF RESISTANCE: discontent, rebellion (1775), revolt (1776). Expulsion of France in Seven Years' War makes safe the *Declaration of Independence*.

(2) CAMPAIGNS: in New England, 1775-6; in Middle States, 1777-9; in South, 1779-83. Chief landmarks: Saratoga, 1777; Yorktown, 1781.

(3) DEFENCE OF INDIA by Warren Hastings, against internal dissensions, inefficient subordinates, the Maráthás, Haidar Ali, and France.

(4) MINISTERIAL CHANGES OF 1782-4: to be connected with the closing stages of the war, which, thanks to Rodney's victory off The Saints and Elliott's defence of Gibraltar, ends more favourably than at one time looked possible. *Peace of Versailles*, 1783.

B. Foreign History.(ii) *The Kaunitz Transition, 1748-56.*

(1) VOLTAIRE: "L'Europe entière ne vit guère autre chose de plus beaux jours que depuis la paix d'Aix-la-Chapelle jusque vers l'an 1755."

(2) Submerged (a) jealousy of Austria and Russia towards upstart Prussia; (b) annoyance of Austria with Britain.

(iv) *Seven Years' War (Continental), 1756-63.*

(1) CAUSES: determination of Austria (Maria Theresa) and Russia (Elizabeth II.) to suppress their upstart neighbour, Prussia, who had drawn most profit from the War of Austrian Succession.

(2) DIPLOMATIC REVOLUTION OF 1756: the work of Kaunitz, aided by the Pompadour. Anglo-Prussian *Convention of Westminster*, Jan., 1756, brings the long Austro-French negotiations to a head in the *Treaty of Versailles*, June, 1756. Why did France become Austria's cat's paw?

(3) FREDERICK'S CAMPAIGNS (vividly portrayed in Carlyle's "Frederick," the battle-scenes from which are obtainable separately). Attacked on all sides and in all parts of his frontierless dominions, he holds at bay overwhelming forces, but is often almost reduced to despair. Desertion of Great Britain in 1761 seems to involve his ruin: saved by right-about-face on part of Russia.

(4) CHANGES OF PERSONS involve sweeping changes in the character of the war: (a) Charles III. of Spain (1759) revives Bourbon Family Alliance (*Third Family Compact*); (b) George III. of Great Britain (1760) is more eager to trounce Whigs than Bourbons; Katharine II. of Russia (1762) refuses to continue fighting Prussia. *Status quo ante* restored by *Peace of Hubertsburg*.

(vi) *Jesuits and Poland, 1763-74.*

GENERAL: the international period of the Seven Years' War is followed by a period in which the philosopher-kings are setting their houses (and sometimes, not disinterestedly, those of their neighbours) in order.

(1) WESTERN POWERS: France absorbs Lorraine and purchases Corsica, and, on accession of Louis XVI., essay financial reform under Turgot; Spain under Charles III., and Portugal under Pombal, take each a new lease of life. The Bourbon Powers and Portugal combine to compel the suppression of the Jesuits, 1769-73.

(2) EASTERN POWERS: at instigation of Frederick II. (eager to give territorial continuity to his dominions by the acquisition of West Prussia), Prussia, Austria, and Russia join in first partition of Poland, 1772. Motives, losses, gains of the partitioning Powers: was it a blunder or merely a crime?

(viii) *Europe during American Revolution.*

(1) HABSBURG-WITTELSBACK schemes for interchange of territory—whereby the German-speaking element in "Austria" should be increased—foiled by Frederick II.

(2) ARMED NEUTRALITY OF THE NORTH, 1780, illustrates the almost universal dislike felt for Great Britain. Note technical issues at stake, and compare the later maritime struggle in Napoleon's time.

(3) BOURBON POWERS, by intervening in the American War, after the surrender of Burgoyne shows the possibilities of American success, secure the independence of the "United States of America," and thus (but at heavy loss to themselves) exact vengeance on Great Britain for their losses in Seven Years' War.

(4) AMERICAN POLITICAL IDEAS are carried back to Europe by the French officers who served in America: Lafayette and Paine as connecting links.

THE HISTORY OF ENGLISH LITERATURE
AS A SCHOOL SUBJECT.

By J. H. FOWLER, M.A.
Clifton College.

"**T**HHERE are grounds for suspicion," said a *Times* reviewer the other day, "that the history of literature is being overdone." Not a few of us, I fancy, would be ready to subscribe to this critic's opinion. Of books about books there seems to be no end. Histories of English literature—from the projected Cambridge History in fourteen volumes, the work of many eminent hands, downwards through all shapes and sizes to the humble (or sometimes pretentious) shilling primer—pour from the Press. There are rival series of "Epochs" and "Ages." Even our favourite classics can hardly be issued without "forewords" or "appreciations" to tell us what to admire and what to forgive in them; and it is perhaps significant that "The World's Classics," which started out on its voyage bravely without any such encumbrance, put back into port again and began its travels anew, duly ballasted with the inevitable introduction. Is it really necessary, we may ask, that the prevailing fashion should dominate our school studies? Can we not introduce our pupils to English literature, so far as may be, and leave histories of literature and books about literature severely alone?

The question seems to me worth raising. I do not go so far as to say that the history of literature is not a proper subject for study in schools; but I venture to say that we are not likely to teach it wisely until we have considered the possible objections to it, and that we should not allow the fact that it is prescribed for some public examinations to absolve us from the duty of considering its value or worthlessness on general principles.

As it is too often practised, the study of the history of literature means, in great part, the committing to memory of mere lists—names of authors and of books that to nine-tenths of our pupils are never likely to be anything more than names. The more conscientious pupil reproduces the harmless but trivial details of the biographical history with startling fidelity; the less conscientious gives them confusedly and inaccurately; but they mean no more to the one pupil than the other. I confess to the twinge of remorse that visited me for having written in the introduction of an extract from De Quincey that this eminent author passed some years at 42, Lothian Street, Edinburgh, when this highly unimportant fact was served up to me in an examination paper—bread cast upon the waters and found, not to my satisfaction, after many days. The learning of literary judgments is even worse than the learning of names. In too many of the histories used in schools the judgments are themselves second-hand judgments, superficial generalisations and traditional verdicts, jejune, uninspired, and uninspiring. But even when the history is itself a good one, when it is the work of a first-rate critic like

Prof. Saintsbury or Mr. Stopford Brooke, the epithets, learnt and reproduced with a fatal facility, convey no clear impression to the learner's mind. When they do have an effect, as occasionally happens with clever pupils, the gain is very doubtful. Judgments of approbation, perhaps, do little harm. Much less pleasing is the thought of the youthful censors airily repeating the text-book's strictures on authors of whom they have not read a line—"nurslings of improved pedagogy," Coleridge would have called them, "taught to suspect all but their own and their lecturer's wisdom." Such a course of training is not likely to produce genuine students and lovers of literature. We may expect instead—what perhaps we have even now got—a generation who are ready with glib superficial verdicts on books, who skim reviews and "forewords" and "appreciations," but have never learnt to grapple with a serious piece of reading.

It is just to remember what may be urged on the other side, and what we may suppose to have been in the minds of those who framed examinations upon literary history. One great object of a literary training at school should be to put our pupils in the right way of using a library for the rest of their lives. They ought, therefore, to be familiar with all the great names in our national literature—not merely the names of the great authors, but the names of the great books. Each of these names ought to suggest to them treasures which they may possess and enjoy in after-years, when they are old enough to appreciate them or have time to go carefully over the ground of which now they can only take a bird's-eye view. The proverb *Securus iudicat orbis terrarum* may remind us of a second reason. There are certain literary judgments which have been given by the world's voice beyond recall. It is good that we should know these early. They put us in possession of a standard, and they are invaluable in guiding us to the best books and in teaching us to be indifferent to the advertisements of the hour. Thirdly, it may even be said that it is vain to try to teach literature without teaching literary history. We ought not to look at a writer and his book in isolation; we ought to put them in their right relation to other books and other writers. We cannot understand a book unless we understand the writer's environment, and know something of the ideas that were in the air when the book was written, the general movement of the times, the particular history of the author, the books and the experiences that went to his making.

Of all these arguments I gladly acknowledge the weight. The problem seems to be: how to secure the advantages claimed in such arguments for the study of literary history without running the risk of the very serious difficulties and drawbacks which I enumerated at the outset. I have thought it best to devote a large part of my space to setting forth the conditions of the problem. I believe that any teacher who fully realises those conditions, who has made up his mind clearly

about what is to be aimed at, and what is to be avoided, will not be likely to go far wrong in his practice. But I will end my contribution to this unsettled question by stating briefly the conclusions at which, for myself, I have arrived.

(1) LOWER FORMS.—The history of literature is not a good subject for the lower forms of secondary schools. The limited number of hours at the teacher's disposal for English literature should be given to the study of particular books rather than of particular periods. Literary history will at this stage only come in incidentally in the oral teaching of the book; the teacher will certainly give a biographical sketch of the author, will try to awaken interest in him as a man, and make his surroundings as real and vivid to the class as possible.

(2) MIDDLE FORMS.—With middle and higher forms oral teaching of literary history may gradually be introduced, not as a thing by itself, but preferably as an adjunct to the text-book of literature which is being studied, or possibly as an adjunct to a period of general history. But one may lay down the rule that at this stage the teacher should rather aim at using literature to illustrate history than at using history to illustrate literature.

(3) LOCAL HISTORY.—The principle of beginning near home, which has been so much applied of late to history and geography, should not be forgotten in connection with the history of literature. I asked in vain some time ago of a group of school children standing in the main street of Nether Stowey if they could tell me where Coleridge once lived. His name was wholly strange to them, though a tablet marked the house a few paces away. Such ignorance is less common now than it was twenty years ago, and one hopes that it will soon be impossible. That De Quincey lived at 42, Lothian Street, should be of some significance in Edinburgh, though of none in Bristol.

(4) HIGHEST FORMS.—In the highest forms the study of a period may with advantage be substituted sometimes for the study of a single author. But a period is best studied, not in the pages of a literary history, but as far as possible at first hand in the writings of the period. Books of extracts are useful for this purpose, but a book should be chosen in which the extracts are of reasonable length, not mere "snippets" too short to give a real idea of an author's style and too short to awaken the reader's interest. Hales's "Longer English Poems" may well be used in this way, and it may be remarked incidentally that the little biographies included in the notes to that book serve as an excellent model, in what they give and in what they omit, for the teacher's practice. Its division into four chronological periods, which we may call the ages of Shakespeare, Milton, Gray, and Wordsworth respectively, adapts the First Series of Palgrave's "Golden Treasury" excellently to the same purpose. The objection to "snippets" does not apply to lyrical poems which, however short, are complete wholes.

(5) THE TEXT-BOOK.—A small text-book, such as Mr. Stopford Brooke's Primer, may be placed in the hands of an advanced class, but its chief use will be for purposes of reference. The teacher will still rely mainly on oral instruction, trying by the help of extracts and by what he remembers out of his own reading to make the life of the period which he is handling a reality to the class. Jusserand's "Literary History of the English People" should be invaluable to him, not merely for what it actually contains, but in suggesting to him a way of looking at literature that can hardly fail to win the interest and sympathy of the more responsive among his pupils. Unfortunately that history stops, at present, with the Elizabethan age, but we need not let the influence of its example stop there; and for nearer times the material is fuller and more accessible.

(6) HELPS FOR TEACHER AND PUPIL.—As aids to the study of literary history, the "English Men of Letters" Series, Ward's "English Poets," Craik's "English Prose Selections," and Chambers' "Cyclopædia of English Literature" should be in the school library, and one of the large illustrated histories of literature. Mr. Stephen Gwynn's "Masters of Literature" would be read with enjoyment and profit at a comparatively early stage by a boy or girl of literary tastes. Prof. Hales's "Handbooks" and Prof. Saintsbury's histories, as well as the "Periods of European Literature" under his general editorship, are rather for the teacher than the pupil. And even the teacher, I am inclined to believe, will gain more of direct help and inspiration by steeping himself in the great literary biographies—Boswell, Johnson's "Lives of the Poets," Lockhart, Trelvelyan, Thackeray's "Lectures on the English Humourists"—than he is likely to get from the most conscientious perusal of the most conscientious products of modern literary research.

THE NEW THUCYDIDES.¹

THIS book is divided into two parts, Thucydides Historicus and Thucydides Mythicus, which differ widely in their conception, and many will think in value.

In the former part, an analysis is made of the author's methods, which, if it be true, strikes at the root of all ancient history. We have all been brought up under the impression that while Herodotus wrote chronicles, Thucydides was the first scientific historian: scientific both in his treatment of evidence and his insight into causes. It is true he says that the Peloponnesian War was one of the great wars of history, whereas by a true perspective it was not; but his own history has made it seem to be so, so that he is given credit there for more insight perhaps than he deserves. But no one hitherto has been found to take up Mr. Cornford's line of attack. It is briefly this: that Thucydides does not understand what a cause is; he uses *aitia* and *πρόφασις* indiscriminately for

¹ "Thucydides Mythistoricus." By F. M. Cornford. (Arnold.) 10s. (J. net.)

alleged reason, and applies the former specially to the opinions of the men who deliver speeches, i.e., to those motives which popular opinion alleged as reasons. Mr. Cornford holds that the causes of the war were economic; the pressure of the Athenian mercantile classes, who saw the position of the Peiraeus, as the universal mart of exchange, threatened by rivals, and who consequently pushed the rest of the citizens into a war of conquest. He certainly makes some good points in this direction, by asking why the Athenians claimed to possess Nisaea and Pegae; and we feel that there is a truth in this which has been generally overlooked. The attitude of Pericles, too, is explained with much skill and plausibility.

We think, however, that Mr. Cornford is too apt to look on this economic movement as a blind law independent of humanity, something like the law of gravitation. These merchants did not act unconsciously: they had their motives, which when put into words would be *aitiai* in Mr. Cornford's sense, and might therefore be both opinions and causes. No doubt Thucydides has used the word loosely, but we doubt if he were so blind to causes as Mr. Cornford thinks. Certainly his argument on the early history of Greece shows a full appreciation of economic causes; and his history of the war was concerned both with business motives, set forth as *aitiai*, and with secondary causes, such as the affair of Epidamnus. That he rated economic causes below their real value may also be true.

When we come to the second part of the book, we have to express a high degree of admiration. Here Mr. Cornford draws a parallel between the form of this history and the Aeschylean drama, and shows how the Aeschylean demons Peitho, Nemesis, Ate, Hybris, and the rest are embodied in the persons of some of the actors. He uses this idea to explain the principle of selection which guided the author, in choice of the time at which (say) Cleon and Alcibiades are brought on the stage, and the acts which they are made to do. Most ingeniously he shows that on his supposition Thucydides may be acquitted of all suspicion of malice against Cleon. No doubt all readers with any literary sense must have felt that the story was essentially tragic in the Greek sense; so is that of Herodotus, but his story is so irradiated with humour and geniality that this is not so marked. But no one has ever worked out the principle with so great detail and fulness as Mr. Cornford.

It will be seen that the book offers abundant food for thought. The historical criticism must be long weighed and sifted by scholars before its

value can be settled: the result will be either to increase our admiration for Thucydides or to shake our trust in all ancient historians. We incline to think that Thucydides will come well out of the ordeal; but we would not be dogmatic so soon. As to the poetical part, we feel sure that the book will prove deeply interesting to all lovers of literature. In any case, it is one of the most important books that have been written on Thucydides.

NEW LABORATORIES AT THE WHITGIFT GRAMMAR SCHOOL, CROYDON.

New science laboratories, which have many points of interest so far as the fittings are concerned, have recently been opened at the Whitgift Grammar School, Croydon. Great efforts have been made to minimise waste of time and labour in collecting the necessary apparatus for a lecture or for laboratory work, in storing it again after

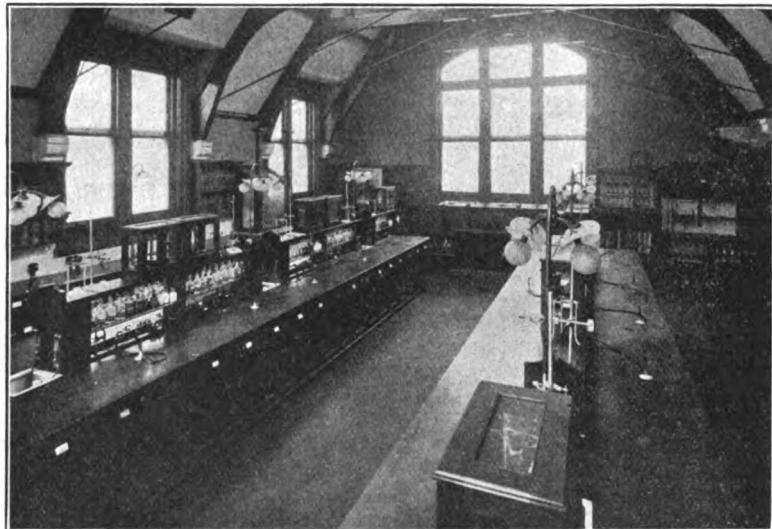


FIG. 1.—General view of Chemical Laboratory from master's demonstration table.

use, and in ensuring that students have at hand all the appliances they are likely to require. Probably no school laboratory has yet been built which provides all the storage accommodation that a science master would like, yet the amount of accommodation afforded by the same amount of wall space available for cupboards and shelves can be increased or correspondingly diminished enormously by attention to or neglect of the details of construction of the cupboards and shelves themselves. Similarly, attention to details can materially reduce the labour of keeping the laboratories clean and orderly; while absolute uniformity of fittings for the working benches and symmetry of arrangement render it easy for a teacher to see at a glance that all apparatus is stored as it should be.

The illustrations show the general arrangement of the rooms and their more important fittings. The chemical laboratory (Fig. 1) is fitted for twenty-eight boys working in pairs. Each pair of boys has eight feet of bench space, one sink, and water-supply tap with side connection for filter pumps, four gas nozzles, two extra water nozzles for attachment to condensers, down-draught flue, two plugs for the supply of electric current from a motor generator and storage battery respectively, balance case,

teak lead-lined waste box, and a single raised reagent shelf.

The reagent shelf is of plate glass, and is raised some

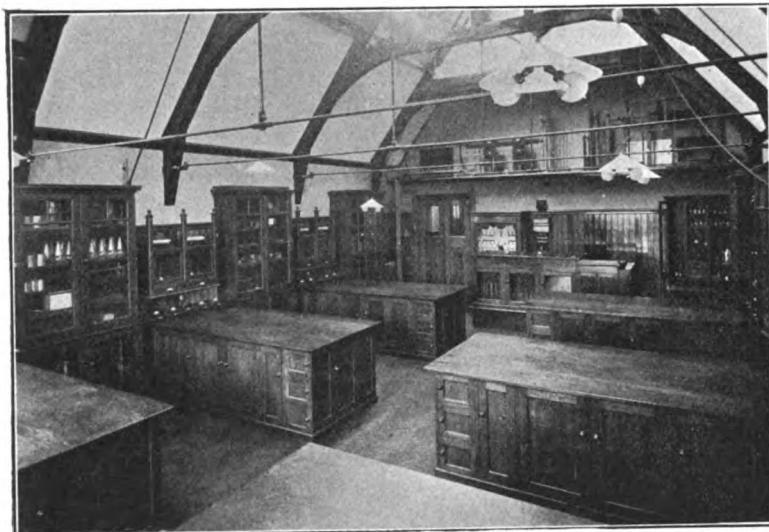


FIG. 2.—General view of Physical Laboratory.

6 in. from the bench top. In the recess beneath are arranged all gas and water nozzles, electricity terminals, and so on. These in turn are fixed on a fillet of teak wood, and set well back, so that glass apparatus is not likely to be pushed back upon them and so broken. Moreover, the working bench, being thus absolutely unencumbered, is easily cleaned. Beneath each working bench are six drawers and lockers, one locker from each set of six being assigned to a pair of boys from the six forms taking practical chemistry.

Fittings of a more general nature comprise: two large combustion chambers, one for gas furnaces and one containing a small "Moissan" electric furnace for the reduction of ores. To secure a good light and to render the work of cleaning easier, these and all fume cupboards and backs of sinks are lined with "Emdica," a thin sheet metal with an enamelled surface.

In the roof a large rain-water tank is fixed, from which water is delivered at taps placed along the walls of the laboratory; below each tap is an iron ring on a swivel arm, in which the students place a funnel and filter paper. The water so obtained is pure enough for many purposes, and greatly reduces the demands upon the still and condenser.

All sinks, other than those on the students' benches, are fitted with Fletcher's Instantaneous Water Heaters, so that apparatus can be quickly cleaned at the end of a lesson.

All store cupboards throughout the laboratories have glazed doors, so that apparatus is easily visible, and the chances of its being put away uncleared or in its wrong place is reduced. All shelves are adjustable, and some of the cupboards have vertical partitions, this arrangement being convenient and economical of space for storing lengthy pieces of glass apparatus.

In the chemical and physical lecture-rooms the space is somewhat limited, but the seats are arranged in three tiers, each 4 ft. from front to back. The desk is continuous and the seats separate, but fixed to the floor. A gangway is left at the back of each row, so that a boy can move from his place without disturbing his neighbours, and the teacher can also move about amongst his class.

In the physical laboratory (Fig. 2) the benches are arranged transversely, with a central gangway. As in the chemical laboratory, each pair of boys has eight clear feet of bench space. At the end of the bench adjoining the wall, the gas and water nozzles and electric current terminals are arranged, and a balance case is fixed on the wall above. The cupboards below vary in size. Some with double-hinged doors occupy the whole length of the bench, and are used for storing bulky apparatus. In others there are partitions.

One of the most useful fittings in this room is the drying cupboard (Fig. 3). This has compartments of various sizes for drying different pieces of apparatus, such as long tubes, electroscopes, &c. All shelves are perforated to allow circulation of hot air, and below the cupboard is an electric heating stove.

The whole of one end of the room is fitted with small drawers containing loose shallow wooden trays for the storage of the innumerable small articles needed in a physical laboratory; each drawer is labelled on the outside, and separate sets of drawers are reserved for accessories for "heat," "electricity," and so on, and thus no time is lost in

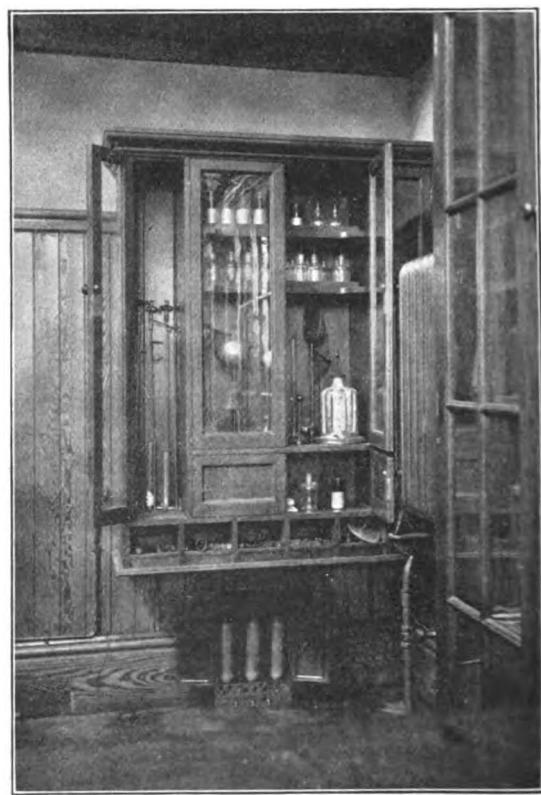


FIG. 3.—Drying cupboard, with electric stove beneath.

searching for apparatus. Here, as in the chemical room, all store cupboards are glazed and have adjustable shelves, some having also the vertical partitions alluded to before.

The advanced physical laboratory is fitted similarly in principle to the main laboratory, except that the working benches are knee-holed, so that boys can sit at their work. There is also a carpenter's bench, and tools for making or repairing apparatus.

The store-room, balance-room, and science master's room call for no comment.

The service of electricity for experimental purposes is very complete. A motor generator with an output of about 2,000 watts is run from the Corporation supply mains. By means of a speed regulator attached on the motor side, and an adjustable resistance in the field of the dynamo, any voltage from 30 to 100 volts can be obtained. The main switchboard is fixed in the physical laboratory. From this board the current from the generator can be diverted to charge a battery of twelve 120 ampere-hour storage cells, and a service from these, in addition to one direct from the generator, is run to each student's working space, while a lighting plug from the mains at 230 volts can be used for optical work. Thus each bench receives a supply from three separate sources: a battery service, giving voltages varying from 2 to 25 volts; motor generator service, giving from 30 to 100 volts; and the supply mains, giving 230 volts.

From the generator and battery leads run to the switchboard in the chemical laboratory, where the current can be regulated and measured independently. All terminals throughout the laboratories are protected by "local fuses," so that the danger of injury to apparatus is greatly reduced, and a "short circuit" at one bench does not interfere with the work at the others.

Cables capable of carrying current up to 20 amperes run to special plugs in the lecture-rooms for use with the arc lanterns.

An interesting piece of apparatus has been made by some of the senior boys, namely, a model of the installation system employed. A small motor is run from the laboratory generator; this is coupled to a small dynamo, which delivers current direct through measuring instruments as on the main switchboard. The current can also be diverted into a battery of small capacity accumulators, and these, again, can be discharged singly or together. The whole apparatus gives an excellent means of demonstrating to a class how current from the supply mains can be transformed and utilised.

EXAMINATIONS FOR L.C.C. INTERMEDIATE SCHOLARSHIPS.¹

(1) ON THE GENERAL SYSTEM OF EXAMINATION.

THE Committee is of opinion that for boys approaching seventeen the examination should be conducted on broader lines than at present. It considers that too much encouragement is given to getting up particular subjects or subdivisions of subjects with a view to their reproduction in examination. For instance, in physics a candidate chooses one special branch, and is practically excluded from the study of other branches during the year or perhaps two years during which he is preparing for the examination. Other instances might be given.

General knowledge, rather than something which has to be "got up," should be the end in view.

Further, the Committee considers that the present system

of attempting to equalise the marks in dissimilar subjects, and of adding up totals, is an unsatisfactory method of selecting scholars.

The Committee, while practically adopting the general principle of the present examination, suggests the following alterations:

First, every candidate shall be compelled to reach a certain standard in (1) English; (2) one language, ancient or modern; (3) mathematics or science.

In English, papers would be set containing an essay and questions in language and literature, in history and in geography; no choice of books, periods, or areas should be given, but a wide range of questions set.

Secondly, every candidate should have the opportunity of showing special knowledge in one of the following three divisions of the examination, but should not be limited in the number of subjects in each division: (1) linguistic; (2) mathematical; (3) scientific.

No definite number of scholarships should be assigned to any one of the three divisions, and the successful candidates should be selected upon the examiners' special recommendation of those who show conspicuous promise in any division.

The Committee considers that this examination should be held for the award of scholarships only, and that only those candidates should be allowed to enter who have a reasonable chance of obtaining a scholarship. In the past many junior scholars have been compelled to enter without any chance of doing so.

(2) SPECIAL REMARKS ON THE SCIENCE SYLLABUS.

There are at present six different science subjects; few select more than one, no one can select more than two; consequently some boys are kept for two years studying chemistry to the exclusion of physics, or electricity to the exclusion of other science.

Any boy hoping to continue his scientific studies after the examinations should certainly have a broader foundation of knowledge than this, and the Committee considers that no boy should be awarded a scholarship in science who does not show some knowledge of general chemistry and of general physics, including mechanics.

The Committee thinks that more latitude should be allowed in the chemistry syllabus: it sees no reason to restrict the volumetric work to acid and alkali only, nor the metallic compounds to those of sodium, potassium, and iron. It thinks that the general principles of volumetric measurement, and of the compounds of the commoner metals, with some physical and some organic chemistry, should be substituted.

The Committee thinks that an oral examination for candidates taking advanced science subjects would be of the greatest value; this might be combined with the practical examination, and might ultimately replace it. It considers that the production of the students' own notebooks would afford an excellent basis for an oral examination.

The Committee considers that the examination in elementary experimental science should be discontinued. The syllabus for this work was intended to introduce children of eleven and twelve to practical scientific method, and to make this a subject to be "got up" by boys of seventeen is to withdraw from it all value. The subject of elementary experimental science has proved invaluable for teaching, but has never proved a satisfactory one for examination purposes.

The Committee is unanimous in recommending that whatever changes are made in the examination, the

¹ Report of the Committee appointed by the London division of the Incorporated Association of Headmasters to consider the general scope of the examination for L.C.C. Intermediate Scholarships, and specially the Science Syllabus.

elementary experimental science and botany should cease to be obligatory on candidates taking higher scientific subjects.

The Committee, while admitting the great importance of manual training as a subject in the school curriculum, considers that it is not a suitable subject for an examination for the award of scholarships.

Signed by C. M. Stuart (Chairman), H. R. Norris, E. H. Pritchard, S. H. Wells, H. J. Spenser, W. G. Rushbrooke, D. L. Scott, H. B. Ryley.

CAMBRIDGE UNIVERSITY LOCAL EXAMINATIONS.

SET SUBJECTS FOR JULY AND DECEMBER, 1908.

RELIGIOUS KNOWLEDGE :—*Preliminary*.—(a) St. Mark; or (for Jewish Students only) II. Kings i.-xvii.; (b) Judges i.-xii.

Juniors.—(a) Joshua i.-xii., xxii.-xxiv.; Judges i.-xii.; (b) St. Mark, or (for Jewish Students only) II. Kings; (c) The Acts of the Apostles xiii.-xxviii.

Seniors.—(a), (b), (c), as Juniors; (d) Philippians and St. James.

ENGLISH LANGUAGE AND LITERATURE :—*Preliminary*.—(c) Scott, "Marmion," Cantos i. and vi. (omitting the Introductions); (d) Kingsley, "The Heroes."

Juniors.—(b) Shakespeare, "The Merchant of Venice"; (c) Scott, "Marmion" (including the Introduction to Canto i., but omitting the Introduction to the other Cantos); (d) a paper of questions of a general, not a detailed, character, on Scott, "Quentin Durward," and "Select Poems of Tennyson," v.-xvii. (ed. George and Hadow, Macmillan).

Seniors.—(b) Shakespeare, "The Merchant of Venice"; (c) Milton, "Comus," "Lycidas," "Sonnets," i., ii., viii.-xxiii.; (d) a paper of questions of a general, not a detailed, character, on Shakespeare, "Coriolanus," the Essays of Bacon, Steele, Lamb, and Macaulay in Peacock's "Selected English Essays" (Frowde), "Selections from Wordsworth" (Cambridge University Press).

HISTORY, GEOGRAPHY, &c. :—*Preliminary*.—History of England. The paper will consist of three Sections on the periods (a) 1066 to 1485, (b) 1485 to 1603, (c) 1603 to 1714 respectively. Candidates may, if they wish, select questions from all three of the Sections, or may confine themselves to two or one of them.

Geography. Great Britain; and general Geography.

Juniors.—(a) History of England. The paper will consist of three Sections on the periods (i) 1066 to 1509, (ii) 1509 to 1688, (iii) 1688 to 1832 respectively. Candidates may, if they wish, select questions from all three of the Sections, or may confine themselves to two or one of them. (b) Outlines of the History of the British Empire from A.D. 1492 to A.D. 1784. (c) Outlines of Roman History from B.C. 44 to A.D. 37.

(d) Geography. The United Kingdom of Great Britain and Ireland, and Europe.

Seniors.—(a) History of England. The paper will consist of three Sections on the periods (i) 55 B.C. to 1509 A.D., (ii) 1509 to 1714, (iii) 1714 to 1867 respectively. Candidates may, if they wish, select questions from all three of the Sections, or may confine themselves to two or one of them. (b) History of the British Empire, as Juniors. (c) Roman History, as Juniors.

(d) Geography. The paper will consist of four Sections on (i) Great Britain and Ireland, (ii) Asia, (iii) Africa, (iv) N. America and the West Indies, respectively. Candidates

may select questions from all four of the Sections, or may confine themselves to any three or any two.

LATIN :—*Preliminary*.—G. M. Edwards, "Colloquia Latina" from Erasmus, omitting xii. (Cambridge University Press); or Cornelius Nepos, "Lives of Miltiades, Themistocles, Aristides, Pausanias, Cimon."

Juniors.—(a) Caesar, "de Bello Gallico," II.; (b) Caesar, "de Bello Gallico," III.; (c) Virgil, "Aeneid," X., 1-501; (d) Virgil, "Aeneid," X., 439-908.

Any two of these four to be taken.

Seniors.—Livy, XXI., 16-56; or Cicero, "In Catilinam," I.-IV. Virgil, "Aeneid," X.; or Horace, "Odes," III.

GREEK :—*Preliminary*.—Sidgwick, "First Greek Reading Book," 3rd edition, Exercises 1-50 (Rivingtons).

Juniors.—(a) Xenophon, "Anabasis," I., 1-5; (b) Xenophon, "Anabasis," I., 6-10; (c) Euripides, "Hecuba," 1-725 (omitting 59-215, 444-483, 629-656); (d) Euripides, "Hecuba," 726-1295 (omitting 905-952).

Any two of these four to be taken.

Seniors.—Plato, "Apology"; or Thucydides, III., 1-50. Homer, "Iliad," VI., VII., 1-312; or Euripides, "Hecuba."

FRENCH :—*Juniors*.—Enault, "Le Chien du Capitaine."

Seniors.—Molière, "Le Misanthrope"; Erckmann-Chatrian, "L'Histoire d'un Conscrit."

GERMAN :—*Juniors*.—"Twenty Stories from Grimm," omitting "Aschenputtel" and "Der goldene Vogel" (Cambridge University Press).

Seniors.—Goethe, "Hermann und Dorothea"; Hauff, "Das Bild des Kaisers."

HISTORY AND CURRENT EVENTS.

THE Colonial Conference should not fail to claim a mention in this column. It is, to use the eloquent words of Sir Wilfrid Laurier in the London Guildhall, "unique. The student may search and search in vain in the pages of history so far back as the records of history will take him; he will not find a precedent; he will not find a parallel." That, perhaps, is partly the reason why we cannot possibly exclude it. Here, at last, is something which is "new under the sun." And yet, when we consider how little of the history of mankind at large is known to the most learned of Europeans, we would not feel too sure. A universal negative is the rashest of statements. What do we know, e.g., of ancient Egypt, that country of constantly surprising new discoveries? of China, where we are coming to realise the truth of old-world travellers' tales and to believe in an ancient civilisation that has stood still for Europe to overtake? or of India, that had empires before the arrival of Europeans? Sir Wilfrid may be correct, nay, probably is. But let us be careful not to commit ourselves.

IN certain respects, our Colonial Conference has some parallels in history. It has been discussing, among other things, its own constitution and the limitation of its powers. The Premiers realise fully that, in the strictest sense, they have no power. They come together merely for consultation. They cannot bind their constituents. Defence of the Empire may be urgent, both military and naval. But they can only compare opinions, agree one with another, and promise to do their best to carry out the resolutions of the Conference. Therein they are like all federations of independent States. What difficulty Hellas had in uniting against Persia, Macedonia, or Rome! What a curious study in constitutional history is

presented by the United Netherlands until they were welded into a unitary State by Napoleon and the Vienna Congress! With what passionate struggles for "State rights" did the United States of America attain what unity they now possess during the century that followed their freedom from Great Britain! Was it sentiment, or material interests, that made for unity in these instances?

"ARBITRATION" may be defined as the decision of an umpire voluntarily submitted to by the parties to a dispute. It will thus be distinguished from "jurisdiction," which is the decision of a judge in cases provided for by the law of a sovereign and not requiring the willing assent of the parties to the dispute. The history of jurisdiction shows in many cases how the first has been the origin of the second, and has constantly tended to grow into the more authoritative form. So in these days, while the word "arbitration" has been retained, we have examples in New Zealand, and more recently in Canada, of laws establishing "compulsory arbitration," i.e., jurisdiction over disputes between employers and employees. Fine and imprisonment are the sanctions for these laws. Opinions apparently differ as to the possibility of enforcing these sanctions, but, as students of contemporary history, we note the growth of government, the diminution of liberty. Strikes and lock-outs are henceforward to be illegal, at least if the State has laid down the terms which each party should accept.

As "arbitration" has grown into "jurisdiction" in the conflict between the individual and the State, so there have, at all times since the break-up of the Roman Empire, been attempts at introducing into the relations of European States "arbitration" as a substitute for wars. The Hague Conference is the outward and visible sign of the latest developments of these ideas, and the "National Arbitration and Peace Congress" of America, lately sitting in New York, has been expressing its hopes that the Conference will get more power in arbitration, i.e., will change arbitration into jurisdiction, or at least advance in that direction. We do not know if this "Congress" is related to a "Peace Society" which existed in America a century ago. If so, the conflict of ideas within the Society has been continuous. Then, they were abusing one another because they differed in their ultimate ideal. Now "there has hardly been a session of the Congress at which more or less of a row has not been developed." Yet they ask now, as they asked then: Why should not States submit to arbitration as individuals submit to courts of justice? Surely their own meetings might supply the answer.

ITEMS OF INTEREST.

GENERAL.

As we go to press the new regulations for secondary schools, which are expected daily from the Board of Education, are not available. Though we must defer any detailed account of them until the actual regulations are before us, Mr. McKenna's recent speech in the House of Commons leads us to expect material changes in the methods to be adopted in distributing grants to secondary schools. One of the regulations promised by the President of the Board states that a secondary school "may be with or without fees, but any scale of fees must be approved by the Board." Dealing with the increased sum of money now available for secondary education, Mr. McKenna said it is proposed to divide the grants for the

ensuing year into two categories. The schools which refuse to remain under any regulations other than the old regulations it is proposed to confine to the old grants, and nothing more. As to the second category, it is proposed that the additional grants shall be given only to the schools which conform to the new conditions.

To obtain grants under the new conditions, there must be, first, a majority of representative managers, either appointed by local representative authorities, such as county or borough councils, district or parish councils, or boards of guardians, or elected by popular local constituencies, such as parish meetings. The second condition is that the instrument under which the school is governed must not require members of the teaching staff to belong or not to belong to any particular denomination; it must not require a majority of the governing body to belong or not to belong to any religious denomination; and it must not provide for the appointment of a majority of the governing body by any person or persons or any body the majority of whom are required to belong or not to belong to any particular denomination. There must also be an adequate number of free places. These must not be confused with scholarships. They are for public elementary school children who are not to be asked to compete with children outside, but who will only be asked to pass a qualifying examination. The general rule is to be that any school receiving the additional grant shall offer at least 25 per cent. of its places for public elementary school children, who shall enter free. The schools may have as many more free places as they like, and where the schools are provided by the local education authority it is trusted they will all be free. There are cases, however, where 25 per cent. of the places will not be used in any case in this way. It is proposed that, where a resolution is passed by the local education authority supporting the application for recognition by a school which does not in all respects comply with the requirements about public management and conscience clause, the Board may, if it sees fit, waive the requirements.

FOLLOWING the annual meeting of the National Education Association, a conference on secondary education was held, presided over by Mr. A. H. D. Acland. The chairman, in opening the proceedings, said that progress towards educational efficiency is almost as slow as ever, and that the country with regard to a matter of this kind is almost as lethargic as ever. Nothing but a new force of national zeal, and still more national co-operation, will relieve the prevailing indifference. One topic of rather personal interest, he said, is the grant of moneys to secondary schools. We are still waiting fulfilment of the promise which was made fifteen months ago, in a letter written by Mr. Birrell, that we should have increased Exchequer grants to secondary schools. Nothing less than an average grant of something like £7 a head from the Exchequer to the secondary day schools of this country will be of any effective avail if the teachers are to be properly paid, and the schools are to be properly equipped and rendered fully serviceable for the children who are received within their walls. There are no schools, Mr. Acland continued, more worthy of public attention than those day schools for the local supply of education above the elementary standard. These will always be largely recruited from the elementary schools, and they ought to be made as little burdensome to the ratepayers, and, above all, to the parents, as possible. If the national policy is to starve and neglect these schools, of which we have some, but not nearly enough, we shall be doing what is

often done in this country—"Spoiling the ship for a half-pennyworth of tar." There are no schools which our neighbours in foreign countries foster more, and rely on more for the development of national intelligence, and there are no schools more deserving of public attention, assistance, and help than these schools.

At a dinner given on May 9th by the City of London Schools Committee of the Corporation "to meet the President of the Board of Education," the Chancellor of the Exchequer, who is an old boy of the City of London School, paid a graceful tribute to his old school. In proposing the toast "The City of London Schools," Mr. Asquith is reported by the *Times* to have said: "It is always a great pleasure to me to find myself once more in the company of those who are interested in the fortunes and prosperity of the City of London Schools. I cannot help remembering that I had the great privilege of having been educated within the walls of the City of London School. When I joined it in 1864 the school was situated between Milk Street and Honey Lane, in the very heart of the City, and it had many disadvantages compared with the more ancient and better endowed foundations of the country. It did not possess so much as a playground, and, though we enjoyed the results of the beneficence of John Carpenter of four or five centuries before, yet our endowments were meagre, and our educational traditions as a school only dated from the earliest years of the reign of Queen Victoria. When a school carried on under those conditions is compared with the great historic foundations of the country—schools like Eton and Winchester—it may well be thought that it had a poor chance of holding its own in the struggle for existence. Yet, somehow, the school did very well. The curriculum was a wide one. When I was first at the school the late Dr. Mortimer was headmaster, and no school ever owed a greater debt to any man than the City of London School owed to Dr. Mortimer. But about a year after I joined the school Dr. Abbott, a brilliant scholar, became the headmaster, and to Dr. Abbott I owe more than to any man living." Schoolmasters do not get so much praise for the efforts they make on behalf of their pupils that they will be other than grateful to a distinguished man for a generous tribute of this kind.

THE annual conference of the Parents' National Educational Union was held on May 13th and 14th. At the first meeting Mrs. E. L. Franklin delivered an address on the objects of the Union, the chief of which is to assist parents of all classes to understand the best principles and methods of education in all its aspects, and especially in those which concern the formation of habits and character. In the evening the headmaster of Eton gave an address on "The Power of the Home," showing how parents could co-operate with teachers in things intellectual. On the second day the headmaster of Clifton College read a paper on "The Product from the Preparatory School and the Direction of Possible Co-operation from the Side of the Home." He spoke of the necessity for a well-thought-out curriculum in the preparatory school, emphasising strongly the importance of teaching boys how to work and of developing their power of concentration. Another paper was by Mrs. Burton Brown, co-principal of Priors' Field School, Godalming, the subject being "Classic and Mediæval Art as a Part of Education." Papers were also read on "The Scope of the Parents' Union in Secondary Education," by Lieut.-Colonel G. R. Ward; and by the Rev. H. T. Bowlby, assistant-master at Eton, on "Continuity of Religious Education between Home and School."

BETWEEN sixty and seventy members of the Art Teachers' Guild met on May 11th at St. Saviour's and St. Olave's Girls' Grammar School, London, Miss Varley, Kensington High School, being in the chair, to discuss the subjects which will be considered at the forthcoming International Congress on the Teaching of Art, to be held in London in 1908. Among the subjects were: drawing in conjunction with modelling and manual work; the training of art teachers; and methods of disseminating ideas of art and developing public taste. Miss Welch, Clapham High School, gave an account of the introduction of modelling into the lower forms of a girls' school, of its connection with, or substitution for, other handwork subjects, and of its value as hand training. Mr. Bowman Porter, Dartford Grammar School, discussed the same subject from the point of view of its efficacy in a boys' grammar school. A debate on the usefulness and practical difficulties of manual training in schools ensued. Miss Giles, Clapton and Stamford Hill School of Art, spoke on the training of art teachers. The same subject was dealt with in a paper by Mr. George Brown, Glasgow. Miss von Wyss, London Day Training College, urged the necessity for teachers of art to undergo a course of training in educational theory generally, as well as in technical training. Miss Pratt, Sheffield High School, emphasised the necessity for the recognition by the teacher of the individuality of each child. Mr. Hine, Harrow School, Miss Flood Jones, St. Paul's Girls' School, and Miss von Berg, Blackheath High School, spoke on methods of disseminating ideas of art and of developing public taste.

THE fourth annual conference of the Girls' School Music Union was held on May 11th at the Froebel Educational Institute, West Kensington. At the general meeting, which preceded the conference, Mr. W. H. Hadow was re-elected president. It was also decided to hold a series of meetings throughout the country in furtherance of the object of the Union, which is to advance music in secondary schools for girls throughout the British Empire, and to provide teachers with the stimulus of social intercourse among professionals. Mr. J. A. Fuller-Maitland, who presided, read a paper on "Enthusiasm in Teaching." Mr. W. H. Hadow, in his presidential address, dealt with the subject of the training of the listener, and warned teachers against the dangers of teaching over the heads of their pupils and condescending to them. Dr. Frederick G. Shinn spoke of the advantages that came from the teaching of the history of music in schools.

THE Jamestown celebrations, to which reference was made in our March number in the notes on History and Current Events, have taken place, and the British Ambassador made a speech on the occasion. Dr. Bryce is the most fitting Englishman—or is he not rather a Scot?—to represent his country in such circumstances. Historian of the Holy Roman Empire, lawyer—they say he is one of the very few who technically worthily has the Oxford degree D.C.L.—author of the standard description of the United States as they are, or at least were a few years ago—his speech was, neither more nor less, the man himself. He spoke of the England of 1607, its men and its politics, of the growth of the colonies, of the unhappy misunderstandings which for fifty years prevailed between the mother country and the daughter nation, and of the community of feeling which has displaced those quarrels, and which he so appropriately represents. As a summary of "American" history, the speech is suitable for reading to our classes.

EXTENSIVE alterations and additions have been completed at the Roan School for Girls, Greenwich. The question of increasing the accommodation of the school had been under consideration for some time, when matters were brought to a head by the action of the Board of Education in strictly limiting the numbers of pupils per class-room in all secondary schools, and by the proposal of the London County Council, early in 1906, to make additional use of the school for its scholarship holders. This necessitated additions being immediately put in hand, both to accommodate the new scholars and to remedy the already over-crowded state of the class-rooms. The total accommodation of the school, allowing the amount of floor space for each scholar sanctioned by the Board of Education, is 350, of which the new rooms take 138 and the old rooms 212. The two new science rooms accommodate twenty-five and twenty-one scholars respectively, and the dining hall seats eighty-eight. The new rooms are furnished in the most modern style, and the equipment for the teaching of science and gymnastics is thoroughly efficient.

THE Governors of Harrow School have informed the Middlesex Education Committee that the Board of Education has declined to continue recognition of the Lower School of John Lyon at Harrow, unless assurances are received that additional accommodation will be provided. The Governors are of opinion that, owing to the growth of population in the more distant parts of the district, it is most undesirable to enlarge this old school on its present site. In the event of assurances from the County Council that it will provide a suitable school elsewhere, the Governors are willing to carry on the Lower School of John Lyon until Midsummer, 1908, and also—if the necessary powers for an alteration of their statutes can be obtained—to contribute £400 a year to the new school, on the understanding that this contribution shall be appropriated for the benefit of the inhabitants of the old parish of Harrow. Failing such an arrangement, it is feared it will be necessary to reduce at once, and very largely, the number of boys in the school. A recommendation has been made to the Education Committee that, without prejudice to the amount to be paid by the Governors of Harrow School towards a reconstituted Lower School of John Lyon, negotiations should be entered into with them and with the District Council of Harrow and Wealdstone for the erection of a secondary school for boys at Harrow. Objection has been taken to the proposal by representatives of the Harrow district. The recommendation has been adopted in a slightly altered form to meet the views of the Harrow district.

THE International Bureau of Peace, Berne, has circulated copies of the resolutions passed at the fifteenth Universal Peace Congress held at Milan last September. Referring to international education, the resolutions state that, considering the spirit that animates a nation depends not only on the education of the so-called upper classes, but especially on the primary instruction of the whole people, and having in view the close connection between the teaching of the love of peace and instruction in morality, the Congress strongly urges on national Governments, and especially on Ministers of Public Instruction, the introduction in all primary and secondary schools of moral and civic instruction based on the common principles of duty, justice, and human solidarity. The Congress is of opinion that such instruction would result in an effective pacific education as much from the national as from the international point of view.

THE French holiday courses, which have been held with great success during the past eight years by the sea at Villerville, near Trouville, under the patronage of the Alliance Française and with the approval of the Rector of the University of Caen, are to be repeated next August. Inquiries may be addressed to the director of the courses, Prof. L. Bascan, École Supérieure, Rambouillet (S.-et-O.).

MISS WALTER is arranging a holiday in Switzerland this year which should prove useful to women engaged in professional work. The holiday is organised for either a fortnight or three weeks from August 6th. The time will be spent at Grindelwald and Reuti. Grindelwald is between 3,000 ft. and 4,000 ft. above sea-level, and is one of the famous spots of the Bernese Oberland. Reuti, on the Hasliberg (3,500 ft.), is near the top of the Brunig Pass, and is noted for its wonderful view of the Lake Brienz and its beautiful sunsets. Second-class carriages will be reserved from London (third class on the mountain railway above Interlaken), and comfortable hotel accommodation will be provided. The tickets are available for twenty-five days, so that those who wish to make a break at Paris on the return journey can do so. The cost will be about ten guineas for the fortnight or thirteen guineas for three weeks. Applications should be made as early as possible, as the party is limited in number and the hotels fill early. Further particulars can be obtained from Miss L. Edna Walter, 38, Woodberry Grove, Finsbury Park, London, N.

THE issue of *School Science and Mathematics* for last month contains several items of interest to teachers. Mr. J. M. Jameson, in appealing for "more interesting and practical mechanics for the high school," suggests that far less time should be spent by the students in making formal measurements of length, specific gravity, and so on, and that more attention should be given to experimental mechanics, including the dynamics of rotating bodies, the apparatus being thoroughly rough and commercial in character. Subsequent numbers of the periodical will contain details of simple trusses, cranes, and arches adopted by the writer. An interesting article, on "Some of the Symbols of Elementary Mathematics," directs attention to the diversity of meaning attached to various symbols. Thus, in England, a dot before the middle of a figure represents a decimal point, but if near to the bottom of a figure it represents multiplication; in America the reverse interpretation is general. The writer advises the universal use of the comma as a decimal point—the method already adopted in Germany, France, and Italy. The articles on "High Explosives" and on "Some Recent Advances in Physical Science" will be useful to the teacher who has insufficient time and opportunity to obtain the information from original sources. An interesting feature of this publication is the "Problem Department," to which instructive problems in mathematics, geometry, and applied mathematics are submitted by readers; solutions to these are invited, and subsequently printed under the same heading.

MR. A. H. DYKE ACLAND has been elected chairman of the Consultative Committee of the Board of Education in place of Sir William Hart Dyke, who has resigned. Mr. Acland was vice-president of the Committee of Council on Education in the Liberal Ministry of 1892-5.

MR. CHARLES LOWRY, headmaster of Sedbergh School, and formerly assistant-master at Eton, has been appointed by the Skinners' Company to be headmaster of Tonbridge School in succession to the Rev. Dr. Tancock.

THE annual conference of the Association of Head-mistresses will be held on June 7th and 8th at the Grey Coat Hospital, Westminster, S.W.

In consequence of the changes in the assessment of income tax, it will be impossible for the existing staff of surveyors to cope with the work, which must be much increased by differentiated rates, closer scrutiny of income, and a super-tax. The number of vacancies for the coming examination to be held in July is thirty—much larger than usual. The limits of age are nineteen and twenty-two. Candidates who were within the prescribed limits on January 1st, 1907, and those who will be on January 1st, 1908, will on this occasion be eligible to compete. Forms of application will shortly be ready for issue, and will be obtainable from the secretary, Civil Service Commission, Burlington Gardens, London, to whom they must be returned by June 27th. The subjects of examination are: English composition, arithmetic, accountancy, political economy, law of evidence; and three chosen from Latin, French, German, geography and history, and geometry and algebra. The salary scale is as follows: assistant surveyors, £100 a year, rising by £10 annually to £180; surveyors of the fourth, third, second, and first class, £200, by £12 to £380; £430, by £15 to £550; £600; £620, by £20 to £700.

SCOTTISH.

THE Education Department has issued a circular to the Secondary Education Committees calling on them to submit their schemes for the distribution of the moneys allocated to them not later than June 1st. Their list of nominations of junior students should, as far as possible, be completed before the end of the summer session in order that candidates may begin their studies immediately after the long vacation. The general principles that should guide committees in framing their scheme of bursaries are also laid down. Unless in exceptional circumstances, no financial assistance should be given to pupils under fourteen, the compulsory age limit. The bursaries should be distributed equitably over the different schools providing qualified applicants, at least one bursary going to every such school. Competition for a bursary, if unavoidable owing to the number of applicants, should be restricted to competition between pupils of the same school. In determining the amount of the bursary, regard should be had to the necessary expenses of applicants, e.g., in travelling or in boarding at the centre of instruction. While a certain number of bursaries must be reserved for deserving junior students, these should form part of the scheme for secondary pupils generally. The conditions outlined above are in line with the best educational opinion, and the Department is to be congratulated on the admirable lead it has given the whole country in regard to the conditions that should govern the allocation of bursaries.

THE conference of Scottish School Boards on the Education Bill afforded an excellent object-lesson on the inability of existing school boards to take a broad view of their duties and responsibilities. The Bill seeks to increase in many directions the powers invested in the boards. At this conference it was conclusively proved that they did not want extended powers. They have been so long obsessed by the parochial idea that they can think of no wider horizon. "Whatever is, is right" sums up their attitude to every offer of advance and reform in educational administration. The Lord Advocate, Mr. Thomas Shaw, M.P., has sung paens in praise of the parish boards, and now they turn round and rend him and his Bill. In all this there is a certain measure of poetic justice.

Mr. Shaw has championed the small area in the face of the most obvious facts and against the opinions of almost all having a direct knowledge of educational affairs. Small boards look at everything from "what is the siller" point of view, and as extended powers mean greater expenditure, they are determined to have none of them. All this, while strongly confirming the general opinion of the inefficiency of existing school boards, tends to lessen the prospects of the present Education Bill. It has to be recognised that there is little driving power behind the Bill, and the forces of parochialism are all united against it. The Bill is a much bigger and better measure than most people give it credit for. The absence of any provision for enlarged areas has disappointed the country as a whole, but enough remains of solid value to make all friends of education unite in putting forth every effort to get it passed.

THE following resolutions were adopted by the conference after long and acrimonious discussion (one of the members said in public that the proceedings would have disgraced a dockers' meeting): (i) That school boards should not defray the expense of providing facilities for physical education or recreation fields for pupils in voluntary schools; (ii) that boards be empowered to provide pensions for officers or servants other than teachers; (iii) that the provision of meals be not a charge upon the school fund; (iv) that free books be not provided; (v) that it be incumbent on the Department to pay the whole, and not one half (as proposed in the Bill), of the supplement to teachers' pensions; (vi) that a sum of £40,000 be set apart from the consolidated school fund to meet the cost of the extra powers imposed by the Bill; (vii) that the meeting petition against the Provisions of Meals (Scotland) Bill.

SIR HENRY CRAIK, speaking at Inverness on the Education (Scotland) Bill, said that he regrets it does not propose to deal with those larger questions of administration and administrative area which must be settled before the problems of higher education can be dealt with in the best possible way. At the same time, the Bill contains many valuable features that ought to commend it to all interested in education. It is satisfactory to find that provision is made to supplement the insufficient pensions of teachers under the Superannuation Act. He welcomes this, not only in the interests of teachers, but in the much wider interests of education, which require a cultured and contented profession. He attaches very great importance to the proposals with regard to the compulsory attendance at continuation schools. Compulsion, if it is to be effective at all, must not be left to the option of school boards. It must be placed upon them as part of their statutory duties. There is at present an immense wastage of valuable work in the three or four years that follow life in the elementary schools. Sir Henry Craik also advocates that part of the time in the continuation school should be devoted to military training, not for the encouragement of militarism, but to teach, as no other training could, the virtues of discipline, obedience, and self-restraint that lay at the very roots of good citizenship.

THE sub-committee on Ordinances of Edinburgh University Council has issued its report on the preliminary examination. The report says that the preliminary examination, as it exists at present, is at once a source of weakness to the University and a serious hindrance to the freedom and efficiency of secondary schools. At present a student may enter the University before he has completed his preliminary, with the result that some of the preliminary

subjects remain to distract him from his proper degree work. What is required is to see that the intending student has reached such a fair level of general education as to justify his being left free to pursue the particular degree course he prefers. In such a course no subject should be regarded as compulsory save English. Such a test of general fitness to take advantage of a university course the committee considers is supplied by the Leaving Certificate examination of the Scotch Education Department. The committee consequently thinks the Leaving Certificate and the preliminary examinations should be amalgamated, and urges that the Education Department should be approached to arrange a course satisfactory to all the universities. It should be noted that no provision is made by this proposal for granting entrance to any students who have not had the advantage of a secondary-school education. For this class some form of preliminary examination other than a course must always be maintained. In all other respects, however, the recommendations proceed on sound educational lines.

THE recently issued report by Dr. W. Leslie Mackenzie on the teaching of school and personal hygiene to students in training as teachers in Scotland is an interesting summary of the work now being done in this direction, with characteristic thoroughness and very encouraging success, in the Northern Kingdom. All the training colleges in Scotland, and all the committees in charge of King's students, have instituted courses in the laws of health, and twelve such courses altogether were given in the year 1905-6. It was speedily discovered that the results of teaching by simply expository lectures dealing with elementary anatomy, physiology, and hygiene were not satisfactory. This is not surprising, for the essential aim of such instruction "is not the verbal reproduction of written or spoken descriptions, but the practical skill that comes of properly directed observation." Since, however, the transition from mere systematic lectures to practical training in observation has been accomplished, the interest of the students has been markedly stimulated, and their work has attained a very practical value. There is no school but contains some children inferior to their fellows in either physical or mental capacity. This kind of training which, by a permissible extension of the word, may be termed "clinical," combines the recognition of defective physique or mental incapacity with instruction in the essentials of its underlying cause, and not only disabuses the teacher of the natural assumption that all children should learn at the same pace, but at the same time trains him in observing all the conditions which tend to obstruct the process of education, both mental and physical. That which the teacher thus learns to do speedily and with intelligence can never, indeed, be a substitute for a system of medical inspection; but it is indispensable to the success of such a system. For not the least important result of adequate training in the elementary laws of health is to prepare the teacher to discriminate between those slighter variations from the normal which are of no consequence to the education of the child and those other and more serious disabilities which should be submitted for medical investigation. To this end the combination of observation and demonstration has proved exceedingly satisfactory in practice.

THE blue ribbon of the French Académie des Inscriptions et Belles-Lettres has been conferred upon Dr. George MacDonald, assistant-secretary in Edinburgh to the Scotch Education Department. His "Catalogue of Greek Coins" in the Hunterian Museum, Glasgow University, is de-

clared to share with "Corpus Nummorum," a publication by the Prussian Academy of Sciences, the distinction of being the most valuable contribution to archeology during the past year. Dr. MacDonald was Rhind Lecturer on Achæology in 1904, and is Honorary Curator of Coins to the Antiquarian Society of Scotland.

IRISH.

THE Government has proposed a plan for the improvement of Irish education, primary and secondary, but on account of the opposition of the Nationalists there is little hope that it will be carried into effect. Under the new Irish Council Bill of 82 elected and 24 nominated members, there was to be constituted a new Education Department, and, when constructed, the powers and funds of the present National and Intermediate Commissioners would be transferred to it, and the Commissions they represent would *ipso facto* cease to exist. Mr. Birrell in introducing the Bill stated that to this part of it he attached tremendous importance, and there can be no doubt that the reform of education is one of the most urgent of Irish problems; for the first time there would be in Ireland an Education Department having responsibility for both primary and secondary (but not university) education. The nucleus of the department would consist of a committee of the Council with power for the Lord Lieutenant to appoint outsiders, some of whom might be women, as additional members of the committee, these, however, not to exceed one-quarter of the total number of the committee. The committee would be appointed for three years. It was proposed to hand over to the Council, in addition to the present funds of the departments of which it would have control, a sum of £650,000, some of which was earmarked for special purposes, but some of the remainder would be available for education.

ONE point suggests itself. How much is the intermediate grant supposed to be? Mr. Redmond pointed out in the debate on the introduction of the Bill that it had fallen in the last two or three years by a sum between £12,000 and £15,000, owing to the drop in the "whiskey" grant. Although English education had suffered in a similar manner, there had been compensation for it by other grants; but in Ireland this had not been the case. If, as we understand, the Chancellor of the Exchequer proposes next year to replace the Local Taxation grants by a lump sum, we trust that for intermediate education it will not be on the scale of the last year or two, but on the scale of the several years preceding. Mr. Birrell quoted the figure as £81,000, but until 1905 it was regularly about £90,000. An attempt was made to raise a discussion in the House of Commons on this point, but it was impossible, as there was no vote of money on which it could be brought forward, unless, as was suggested, the Government consent to bring in a supplementary vote to compensate in the present year for the loss to intermediate education.

No date has as yet been fixed for the introduction of the University Bill, and there is therefore somewhat of a lull in the public discussion of it. There has, however, been one important pronouncement dealing with it during the past month, viz., that of the Roman Catholic bishops. After commanding the Government for taking up the grievance and for proposing a speedy settlement, they stated that they believed that within the general outline of Mr. Bryce's plan the Catholic claims could be met and suitable provision made for the general educational interests of the country. Their resolution continued with some important words. The University question can only be settled

by a compromise, and while the bishops would like a Catholic University, they are definitely prepared to accept as final any one of the three proposals put forward by them before the Royal Commission, viz.: (1) a new Roman Catholic University; (2) a second college in Dublin University; and (3) a college in the Royal University. They will support the Government in proposing any one of these, but the Government must bear the responsibility of the choice.

At the conferring of degrees in Trinity College towards the end of April about sixty women from Oxford and Cambridge were presented. At the luncheon which followed in the dining hall, the Provost seized the opportunity to explain how it came to pass that Trinity had offered *ad eundem* degrees to these students. No one was more surprised than Trinity College at the large numbers who had availed themselves of the privilege, but the proposal as originally made was intended to remedy the grievance which it was thought some Irish women resident in Dublin and elsewhere would have who did not possess a degree, and in the days before Trinity College opened its doors to them women had gone to Oxford or Cambridge. These women in present circumstances would have gone to Trinity, and in the course of a year or two would be unfairly handicapped owing to their want of degrees in competition with other women, fortunately born at a later date, who had obtained them. It was thought these would be very few, and the actual number coming across from England and elsewhere had quite surpassed all expectations. The privilege, however, would come to an end with the close of the present year.

THE twenty-fifth report of the Royal University, covering the year 1906, which has just been presented to Parliament, gives a verbatim account of the twenty-fifth annual meeting held in Dublin on October 26th last. The total number of persons entering for the various examinations of the University was 3,733, as compared with 3,474 in 1905. Whereas in 1881 only 508 students matriculated, in 1906 the number was 947. With the view of co-ordinating the University courses and those of the Intermediate Board, the Senate has enacted that any candidate who shall have passed the senior grade examination of the latter in the subjects prescribed for the matriculation examination of the University shall, on application in the year in which he has so passed, be entitled to be entered as a matriculated student of the University. This regulation has been welcomed by the schools as lessening the burden of examinations.

THE Department's *Journal* for April is remarkable for an account of technical instruction in the city of Belfast, the first of a series of articles which it is proposed to issue in the *Journal* on recently erected technical schools in Ireland. It is illustrated by some striking photographs of the new Municipal Technical Institute in Belfast, which has been erected at the cost of £100,000. The Institute covers an area of 133,862 square feet. The number of students last session was 5,000.

WELSH.

THE Board of Education has issued its new regulations for the preliminary examination of elementary-school teachers, to come into force on August 1st, 1907 (p. 208). By these regulations, bursaries will be given to young teachers, to be named bursars, allowed to teach from seventeen years of age upwards. The regulations are, of course, made for England only. Some dissatisfaction has been expressed at the omission of Wales and Mon-

mouthshire from the new arrangement. But, of course, this is inevitable. The provision of a Welsh Department of Education excludes Wales from the English regulations. If Wales wishes for a system of "bursars," it is to the Welsh Department it must look, so as to obtain an extension of the English system.

THE Pembrokeshire County Council has decided to insure the teachers in the provided schools of the county against accidents. The County Education Authority declines to take any action with regard to the teachers in the non-provided schools. It is said that a legal decision supports the Education Authority in its contention that it is not liable for damages with regard to teachers in non-provided schools. It may be so, but, after all, the non-provided school teacher is teaching all the secular subjects of the time-table, and an accident might happen to the teacher during these periods.

A CONFERENCE has been held at Aberystwyth on legal education. Already the Law Department of the University College of Wales, Aberystwyth, prepares students for the four-year course for the LL.B. of the University of Wales. Lectures are also given by the Aberystwyth Department of Law at Swansea. It was decided to form a Board of Legal Studies for Wales to meet the problem of the legal education of articled clerks in Wales in both the large and small towns. The directions of development suggested were the reduction of the university course for the degree of LL.B. from four years to three, and the establishment of short special courses for articled clerks on the lines of those now carried on at Aberystwyth and Swansea.

AT the annual meeting of the Welsh County Schools Association at Aberystwyth, a motion was unanimously passed deprecating the proposals in the Glamorgan county draft amended scheme for intermediate schools to limit the power of appointment of assistants, now vested in the headmaster of the school, and to take away his present power of dismissal. It was also resolved that it should be made compulsory that any new secondary schools established by education authorities should be under the Welsh Act. The county schools have long bemoaned the dual inspection imposed on them, viz., by the Central Welsh Board and the Board of Education. Naturally, the association looks to the new Welsh Department to consider the mitigation of the worry incident to duplicated inspections. At the same meeting Mr. Rhys Morgan described the equipment of the laboratory for geographical teaching at Pontypridd County School, which is claimed to be the first of its kind established in Wales.

ATTENTION ought to be directed to Dr. Fleure's report on Welsh Anthropological Measurements as read to the University of Wales Guild of Graduates. It began by an appreciation of the help given by the Guild of Graduates, and an appeal to schoolmasters, ministers, and others, to give help in arranging meetings for carrying out observations in various villages. A year ago the total number of persons measured was 300; this has now been increased to 700, and includes a far greater proportion of village folk. The family history of each subject is recorded as fully as possible, about twenty observations of various features are set down, and twenty measurements taken. Such complex records can only be analysed very slowly, and up to the present the rates of head-breadth to head-length and the degree of pigmentation have alone been taken into account. The following preliminary provisional suggestions were made: It is probable that the dark,

narrow-headed people represent the ancient stock of the present population of Britain, and they occur typically in the remote villages. The dark, broad-headed people and the fair, tall, medium-headed group may have together formed the Celtic people united by a common civilisation and language, the indications being that the light-haired people were the military and ruling caste.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

V. Hugo, Hernani. Edited by C. Kemshead. xvi+166 pp. (Clarendon Press.) 2s. net.—This edition of "Hernani" hardly reaches the standard of other volumes in the Oxford Higher French Series. The introduction contains a very brief summary of the history of the drama up to "Hernani." It might have been pointed out that the Romantic drama owed more to the existing melodrama than to influence from abroad (Madame de Staél and Schlegel); some allusion to other Romantic plays might have been made; nor should the important changes in metre, largely brought about by Hugo, have been passed over. Such a statement as this (on p. 90), that "enjambement invariably spoils the rhythm of the verse," is only true when the enjambement is very frequently employed, and in "Hernani" that can hardly be maintained; on the other hand, we have as a consequence of more "overflow" less of that inversion which often renders the speeches in Corneille so trying. The notes give all historical information that is necessary, and some philological details which seem altogether superfluous. Who, in reading "Hernani," wishes to be told the derivation of *casaque* or *hasard*, or the fact that *ξέινος* is a poetical form of *ξένος*?

Molière, Le Tartuffe. Edited by C. H. C. Wright. ix+154 pp. (Heath.) 1s. 6d.—This play will hardly be read in our schools, although Mr. Wright has the schoolboy as well as the undergraduate in mind (p. ix). He has written a brief introduction and good notes. We are glad to observe that the text is preceded by the *Préface* of 1669 and the *Placets au Roi*.

Pailletton, Le Monde où l'on s'ennuie. Edited by W. R. Price. x+170 pp. (Ginn.) 2s.—We recommend this edition of Pailleron's admirable comedy. The editor gives the main facts of the author's life, briefly and without tall talk. Excellent footnotes are added to the well-printed text. There are also questions in French and some passages for retranslation, with only occasionally an American touch ("It is right here that reputations are made; she arrived on the five o'clock train"). The vocabulary is complete.

Arnold's Lectures Françaises. Book I. By Jetta S. Wolff. viii+135 pp. (Arnold.) 1s. 3d.—A good selection of by no means hackneyed prose and verse, with original contributions by Miss Wolff, which particularly pleased us. The book is illustrated with some full-page reproductions of well-known pictures; we regret to see Louis XV. in the place of honour, and Lancret's picture has been too much reduced. The questionnaire is rather scanty, covering only 13 pages to 104 of text. The vocabulary is incomplete.

Mme de Ségur, Mémoires de Cadichon. Edited by J. F. Rhoades. 80 pp. (Methuen.) 1s.—This forms a volume of Methuen's Simplified French Texts. The 400 pages of the "Mémoires d'un âne" have been skilfully compressed into less than 50. There are no notes; the vocabulary is complete. A nice reader for the third or fourth year.

Classics.

The Restored Pronunciation of Greek and Latin, with Tables and Practical Illustrations. By Dr. E. V. Arnold and Dr. R. S. Conway. Third and revised edition. vi+26 pp. (Cambridge University Press.) 1s.

How to Pronounce Latin: a few Words to Teachers. By Dr. J. P. Postgate. 32 pp. (Bell.) 1s.

The Roman Pronunciation of Latin. A Reprint of Sections from Dent's "First Latin Book." By H. W. Atkinson and J. W. E. Pearce. 29 pp. (Dent.) 6d.

With these pamphlets, the modern teacher need not be at a loss either for knowledge how to reform or for arguments in support of reform. The pamphlet of Prof. Arnold and Prof. Conway was first in the field, and for a long time stood alone; it still stands alone in dealing with Greek as well as Latin. This edition has been revised, and an appendix added on the Greek aspirates. This appendix is very good; it neglects, however, one important and convincing piece of evidence for the aspirated consonants in the Sanskrit transliterations of Greek names, which have been collected by the late Prof. Bendall. We should like to have seen an appendix also on the accent, the evidence for which is not easily available. Perhaps this subject was not fully dealt with because the writers seem to despair of its being practically useful; the possibility, however, is not to be summarily dismissed. Dr. Postgate's pamphlet is more controversial, and admirably sums up the arguments for and against reform: he also presents the evidence fully and clearly. A few Latin passages in phonetic transcript are added. Both these should be in the hands of every scholar. The third pamphlet is not of the same scientific value. Thus the writers state that long vowels differ from short in quality as well as in quantity (p. 6), which is not the case. Nor is Latin i the i of English fit, nor ô the vowel of French chaud. And the elaborate assimilation of final nasals, as given in the phonetic transcripts, is a needless difficulty: needless, because to a certain extent it is inevitable, and because we do not need to speak Latin in a coffee-shop; difficult, because it imparts another piece of self-consciousness when we wish to be natural. For the rest, the student will find the pamphlet useful.

The Satires of Juvenal. With Introduction and Notes by A. F. Cole. xii+382 pp. (The Temple Greek and Latin Classics.) 2s. 6d. net.—We have already reviewed two or three of these cheap reprints. Juvenal follows the same general type. The introduction and notes are kept down to a very narrow limit, and give only what is barely necessary. Gifford's translation is printed facing the text, and the notes point out any place in which Gifford used a different text. Gifford is really quite good, and he glides gently over delicate passages; the text is familiar. Altogether the book is worth buying. Satires II. and IX. are omitted; otherwise it seems to be complete.

Aeschylus in English Verse: Prometheus Bound and Suppliant Maidens. By A. S. Way. 106 pp. (Macmillan.) 3s. 6d. net.—Mr. Way has done so good service to classical study in his translation of Euripides, that we regret to be obliged to speak with dissatisfaction of his Aeschylus. Mr. Way has here attempted a task beyond his powers. Euripides depends for his effect on his substance, and his language is that of every day; his rhythms are also less careful than those of his great predecessors. But Aeschylus demands a fine ear and a noble vocabulary. Mr. Way has not a good ear. He is best in his iambics, although these are tame and commonplace in rhythm, and

sometimes a line is hardly recognisable for iambic; many of the longer pieces, however, are quite readable. But the lyrics are painful in many places, and are not fit to be read aloud. His chief fault is a hurrying over full syllables. The so-called anapaestic metres are unsuited to the English language, except for short spells; they have a flippant effect as a rule, and quite spoil the impression of Aeschylus. Take this, for example:

"Fear nothing! in all loving-kindness doth gather our array, with swift racing of pinions on-faring."

We write it without dividing the lines, to show how unnatural is the emphasis. The slurring of three syllables (*gáther our arráy*) is especially offensive: it occurs often—on the same page we read "that Gód ill-fated-who-of-Zéus is abhorréd." We have noted a great many more examples of slovenly rhythms. The vocabulary, again, is not noble: "high-thoughted son of Themis," "deep-grassed mead," "to buckler," are chance examples. "The Suppliants" is better than "Prometheus," we think.

Multum in Parvo. 18 pp. each. Latin 6d., English 6d. (Cambridge: Macmillan and Bowes.)—Mr. Dunn, late headmaster of Bath College, kept a record of common mistakes in Latin prose, and these were then embodied in 200 sentences full of "tips." These are here published in both Latin and English. They can be used for *viva voce* construing, and will undoubtedly be useful for that purpose. They are diabolically ingenious.

English.

Murray's English Literature Series. The Story of English Literature. (Elizabethan Period.) By E. W. Edmunds. 1-388 pp. 3s. 6d. *Readings in English Literature.* Junior, Intermediate, and Senior Courses. (Elizabethan Period.) 2s. 6d. each.—Here we have a very clear attempt to teach literature by means of a very full guide (the Story) and accompanying illustrations—the Readings. The experiment, it seems to the present writer, might be very successful in a good hand: but else it would be likely to fail. How could junior students using the junior course appreciate the advanced work in "The Story of English Literature," and how should the story intended for all three courses be dealt with three times in the boy's school life? The preface does not help us much, for it states that the "Story" is for schools and colleges and the illustrations for schools. Nevertheless, the authors (for Mr. Spooner has helped Mr. Edmunds) say that the method of using a critical and an illustrative book has succeeded; but why not have a school library? A large number of masterpieces may now be bought for half-a-crown, and the teacher may choose for himself. It seems ungracious to question the value of such admirable work: but we would rather see a little criticism (if we must have it) and plenty of illustration in one volume. It is surprising, too, to find a large part of "Romeo and Juliet" in the junior course, part of the "Rape of Lucrece" in the intermediate course, and a certain amount of Marlowe's extremely wanton "Hero and Leander" in the senior course. The first two seem unsuitable, and the last could scarcely be read aloud with any class, young or adult. Has not the title "The Story of English Literature" been used already by Miss Buckland?

The Foreign Debt of English Literature. By T. G. Tucker. 1-270 pp. (Bell.) 5s.—Such a book as this has been wanted for some time: it will collect and clarify the student's knowledge of bits of European literature, and it is to be used along with a good history of comparative

literatures. The debt of England to Homer, Theocritus, and Euripides: the debt to Virgil and Horace; to the fabliaux and the old French Romances; to Dante and Petrarch: we all know something of this, and now it is lucidly set forth. One complaint we have to make, and that is that Dr. Tucker has not dealt with our debt in the matter of form. How was old English alliterative verse killed? Who made rhyme, our senseless love of rhyme, so popular, that we can scarcely do without it? What authors established the law that sense without sound is insufficient? These are questions which perhaps will be treated in another volume. Many suggestive tables are inserted.

Higher English. By F. J. Rahtz. 1-376 pp. (Methuen.) 3s. 6d.—This volume is mainly a guide to London Matriculation English, and, though it is not new, it is very full, and for its purpose complete. Surely "swollen, gotten, graven, shorn," are not "only used as adjectives," and "coalition" does not require dots of diaeresis. The treatment of inverted commas is insufficient, and ten lines on slang are, in these slangy days, ninety lines too little. The illustrations, generally, are abundant.

The Red Letter Shakespeare. King Lear. Edited by E. K. Chambers. *Titus Andronicus.* Edited by E. K. Chambers. *Hamlet.* Edited by E. K. Chambers. (Blackie.) 1s. 6d. net each.—We feel sure that lovers of Shakespeare who have once become acquainted with this dainty edition will not rest satisfied until they possess all the plays in so attractive a dress. Mr. Chambers's introductions give an added charm to these volumes.

The Red Letter Library. Walden. By Henry D. Thoreau. With an Introduction by Richard Whiteing. (Blackie.) 2s. 6d. net.—A worthy addition to an excellent and widely appreciated series.

History.

An Introduction to the History of Modern Europe. By A. Weir. xv+340 pp. (Methuen.) 6s.—On p. 260, at the beginning of a chapter on National Literature in Germany, the author summarises his previous chapters in such a way that we cannot give a better account of the book than by transcribing his words. "After account has been taken," he says, "of the political structure and aspirations, of the industrial organisations, commercial principles and mechanical resources, of the scientific knowledge and speculative insight of a period . . . there still remains . . . the province of pure literature." In other words, this is an exposition of European history, from the middle of the eighteenth century with its enlightened despots to the immediately post-Waterloo time. "Though historical in form, the book does not pretend to be a history, but aims at presenting such a preliminary view of the immediate antecedents of modern civilisation as will supply a sufficient basis for a comprehensive study of our age." In this aim the author has attained a large measure of success. The book is not always easy reading, and at times we wish the meaning had been clearer, but it will help the careful reader to understand the European revolution which is commonly called the "French." Dates are sometimes missing in the text, but there is a chronological table, as well as two bibliographies and an index.

History of England. Vol. i., to 1509. By Dr. W. J. Perry. xvi+362 pp. (Relfe Bros.) 3s.—Dr. Perry, headmaster of St. Anne's School, Redhill, is dissatisfied with "the general method adopted by writers of the text-books

in general use," and thinks that "more importance ought to be given to the study of the development and growth of the English Constitution." He has therefore "endeavoured to form his own opinions," and the result is the book under review. We think Dr. Perry has been unfortunate in the text-books he has seen. We can assure him that some of the more recent, the names of which he does not seem to know, would quite satisfy his requirements, and would have saved him the trouble of writing a book. At any rate, we cannot recommend his attempt. He is quite out of date in his information; the authorities he quotes are for the most part antiquated; his constitutional history is old-fashioned and incorrect in many places. And for the purposes of a school text-book he has another defect. The construction of his sentences is often faulty, sometimes, perhaps, owing to printers' errors, but sometimes not.

Heroes of the European Nations. By A. R. H. Moncrieff. vi+194 pp. (Blackie.) 1s. 6d.—This is a very good little book—one of those which children would read for their own pleasure and to their great profit. Hanging the story almost entirely on the lives of famous men, a sketch is given of the progress of European civilisation from the Trojan war to the battle of Waterloo. The otherwise tedious story of the Middle Ages is made interesting by topical chapters which depart, wisely, from strict chronological order, and it would perhaps have been well if a list of dates and an index had been added. We hope a second edition will afford the opportunity for this improvement.

The Rise and Progress of the English Constitution. By Sir E. Creasy. xi+333 pp. (Macmillan.) 3s. 6d. net.—The first edition of Sir E. Creasy's book was printed in 1853, the sixteenth in 1892. This is a "seventeenth and revised" edition. "Obsolete matters have been removed, and the later chapters have been brought up to date." But we seriously doubt the advantage of this putting of new wine into old bottles. So much has been discovered since 1892, so many new methods of telling our constitutional story have come into deserved vogue, that when the editors "hope they have reformed it indifferently" we feel inclined to reply, "O reform it altogether."

Geography.

Our Own Islands. By H. J. Mackinder. xv+298 pp. (Philip.) 2s. 6d.—This is the first of Mr. Mackinder's much-anticipated "Elementary Studies in Geography," and is an excellent foretaste. Three others are to follow: "Lands Beyond the Channel," "Distant Lands," and "The British Empire." When completed, the series will meet the wants of an elementary or preparatory school. Mr. Mackinder is nothing if not original. Even in his sequence of chapters he strikes a new note; he breaks up his treatment of England by interpolating chapters on Scotland, Ireland, and Wales, and justifies himself with the assertion that "the essential contrasts of our land are only appreciated when it is considered whole." He is at his best when he is insisting on the *human* meaning of geography—and this, we are glad to see, he is always driving home by cause and effect; he is weakest when he is writing down to the level of his young readers. His style stimulates oral instruction; his maps effect realisation. We should have preferred more exercises in the book; these must perforce be left to the teacher to initiate, and he will find plenty of material. The pictures—and there are a large number—are well selected, though not too well printed. Nevertheless, they are genuine illustra-

tions, and should serve the purpose of "question and answer" with gratifying results. The language is easy; there is perhaps a little too much of the appeal to the teacher here and there. The facts are simply put, and the reasoning is clear; that they are accurate goes without saying; that they are up to date is apparent, even though the publishers have not inserted a date on the title-page. There is no index, a defect to be remedied in the future editions, which are sure to be called for.

A Junior Course of Comparative Geography. By P. H. L'Estrange. viii+239 pp. (Philip.) 2s. 6d. net.—In this book, Course A of Mr. L'Estrange's "Progressive Course of Comparative Geography," which we reviewed at length in our issue for February last (p. 76), is published separately. It is unnecessary to state again the characteristics of the method of treatment; it will suffice to say that enough material is provided for two years' work for pupils between the ages of eleven and thirteen, and that the book covers all the countries of the globe.

Philips' Progressive Atlas of Comparative Geography. Edited by P. H. L'Estrange. (Philip.) 3s. 6d. net.—The coloured maps from "A Progressive Course of Comparative Geography" are here published separately. The seventy-two plates with their 172 maps and diagrams should provide everything in the way of an atlas that ordinary classes in a secondary school require. The maps deal with the following aspects of each country: surface characteristics and structure, seasonal temperatures and pressures, winds and rainfall, vegetation, minerals, communications, distribution and population, and political divisions.

Philips' Handy-volume Atlas of the World. By E. G. Ravenstein. Seventy-two plates with 112 pages of index. 3s. 6d.—An atlas which, like this, has reached its seventh edition needs no recommendation here. It is sufficient to state that all the statistical matter in the letterpress has been revised and carefully brought up to date. We are confident that this very convenient atlas will maintain its well-deserved popularity.

Round the World. 72 pp. (Philip.) 6d.—This is a first reader in elementary geography, and is adapted to Philips' "Geographical Chart" or "Wall Atlas" for elementary classes. The language is simple, and the print and paper excellent; but, given the chart above alluded to and a reasonably good teacher, one can hardly understand the *raison d'être* of the book.

Mathematics.

The Teaching of Mathematics in the Elementary and the Secondary School. By J. W. A. Young. xviii+351 pp. (Longmans.) 6s. net.—At the present moment there is no subject that is being more earnestly discussed among teachers than that of the training of the teacher, and the recent discussions on school mathematics have often led to the conclusion that the teacher is of much more importance than any syllabus for the efficient education of the pupil. There is no doubt that the best teachers are born and not made, but it is also true that the finest natural aptitudes can be made more efficient by proper training, and that for the average aspirant to the teaching profession training is indispensable. The book under notice is one of the American Teachers' Series, and is thus to a certain extent limited by the conditions that exist in the United States. But the main theme is not confined to any geographical boundary, and the value of the book is nearly as great for teachers here as for those in America.

The range of the book is very extensive, and a mere enumeration of the titles of its fifteen chapters would exceed the limits of space at our disposal. It is perhaps sufficient to state that there is hardly any question that can arise with respect to the teaching of school mathematics that is not carefully discussed from more than one point of view and illustrated by quotations from many writers. A good bibliography adds greatly to the value of a book which deserves the careful study of all who are interested in the methods of presenting mathematics to the youthful mind, and which should be of special interest to teachers.

A School Algebra Course. By F. Gorse. xii+300 pp. (Cambridge University Press.) 3s.—This work is not so much a text-book of algebra as a collection of examples, which covers the ground up to and including the binomial theorem. The examples are well arranged, and, especially at the beginning, are very well adapted for the average pupil. As a collection of exercises the book has much to recommend it, but we should be sorry to see it become the type of text-book for school use, though we are well aware that many excellent teachers desire that nothing more than sets of examples should be in the hands of their pupils.

Elementary Geometry. By Cecil Hawkins. New edition. viii+306 pp. (Blackie.) 3s. 6d.—The changes made for this edition are said to have been suggested by experience in the class-room, the most notable, so far as we can judge, being in the treatment of parallels. The book is a good piece of work. We are sorry to find that experience has led to the postponement of proofs by symmetry; if it be the case that that method is too hard for beginners, then it must, of course, be reserved for a later stage.

New Geometry Papers. By Rupert Deakin. 103 pp. (Macmillan.) 1s.—There are eighty-four papers, each containing six questions. The papers are divided into fourteen sets, and at the beginning of each set are given the enunciations of the problems and theorems that are specially used in the set. The questions are usually very easy, and seem to be quite suitable for use with elementary classes; and as they cover the field of geometry up to and including similar triangles, they may be found serviceable in the school-room.

Science and Technology.

Nature Studies and Fairy Tales. Part ii. By Catherine I. Dodd. 224 pp.; 16 plates. (Nelson.)—In a commendatory introduction to these lessons for infants, Mr. W. Scott Coward thus describes their aim: "Miss Dodd begins with literature, . . . and, selecting the fairy tale as the most suitable, chooses for the season of the year a subject whose details permit of the introduction into her scheme of the various natural objects, such as birds, insects, trees, flowers, &c., belonging to that season. The drawing of these objects by teachers and scholars finds its proper place in the scheme. Poetry of a suitable character is enlisted into it; and the teaching is all drawn together to culminate in the unfolding and enforcement of some wholesome and important moral lesson." We are assured, and can well believe, that such lessons have met with great success in practice.

Principles of Botany. By J. Y. Bergen and B. M. Davis. ix+555 pp. (Ginn.) 6s. 6d.—This admirable text-book should meet with a warm welcome. Though its method of treatment is essentially elementary, its point of view

is well abreast of recent discovery and speculation, and fairly advanced students will find it to contain many stimulating chapters. Among special features may be mentioned a consecutive series of instructive studies of typical cryptogams as illustrations of the evolutionary history of plants, and a clear discussion of ecological botany. The remarks on classification are so good that many readers will wish they had included considerably more detail. The book contains some 400 excellent illustrations.

Introduction to Plant Ecology. By G. Henslow. x+130 pp. (Stanford.) 2s. 6d.—It goes without saying that an essay by Prof. Henslow on "the study of living plants at home" will amply repay perusal, and both teachers and students of botany will find this little book a storehouse of information and—what is even better—suggestion. We gather that its immediate object is to assist candidates for the examination in botany of the Natural Science Tripos, Cambridge; it ought, however, to appeal to a much wider circle of readers.

The Principles of Horticulture. By Wilfred Mark Webb. 136 pp. (Blackie.) 2s.—This "introduction to the theoretical side of horticulture" has been written primarily for the benefit of those engaged in its practice. We have nothing but praise for the book. It is written in the simplest of language, yet with scrupulous accuracy; the illustrations are excellent and numerous; and, throughout, the fact that successful gardening depends on scientific method is convincingly demonstrated.

An Introduction to Practical Botany. By E. H. Davies. 127 pp. (Dent.) 2s.—This consists of seventy-eight lessons arranged on the heuristic system. The subjects are judiciously selected, and the questions are designed to cultivate accurate observation and thought on the part of the pupils. The course is suitable for young beginners, and may be cordially recommended.

Seasonal Botany. By M. O'Brien Harris. 56 pp., interleaved. (Blackie.) 8d.—A most useful set of hints to teachers on the arrangement of the work of classes taking general and physiological botany. The three years' course mapped out is primarily intended for pupils who have previously gone through a course in experimental science.

The Commoner Wild Birds of Great Britain. By David T. Price. 62 pp. (Gurney and Jackson.) 1s. net.—Those who wish to identify the birds they meet in country rambles will find this little book a useful pocket-companion. The method of classification used is somewhat rough and ready, but, considering its purpose, is no worse on that account.

Miscellaneous.

In Statu Pupillari. viii+287 pp. (Swan Sonnenschein.) 6s.—This is an anonymous novel dealing with the life of girl students at the women's college of "Hypatia," in or near the University of "Atlantis." The geographical and academical terms used throughout show clearly that "Hypatia" stands for Newnham and "Atlantis" stands for Cambridge; and it seems likely that many of the fictitious personages introduced could be readily identified with "real" personages by the Granta. But the portraiture is done with such sympathy that it could hardly give offence to the originals, if there are any and if they still live (for the story deals with the early days of Hypatia); and in this respect, as in many others, the book contrasts very favourably with several notable (or perhaps one should say "notorious") attempts to describe university life in the form of fiction. Quite apart from these personal matters (which naturally appeal more to persons

actively engaged within the pale of the University), the book deserves warm commendation for the skill with which the writer introduces typical scenes without wearying us with the sensational and the hackneyed, and especially for the loving yet not blind insight displayed in depicting the difficulties and aspirations connected with the introduction of higher education for women, and the thoughts and ways of well-differentiated specimens of the sweet girl graduate. The heroine is often reproached by her girl friends with being "too feminine"; but neither her friends nor those who know her only from her biography think any the worse of her for that. Neither those who have themselves experienced life in a women's college, nor those who have not had that experience, could safely pronounce on such a book a general verdict such as "true" or "false"; certainly, however, it impresses itself on one with a slight acquaintance from the outside, with such life as simple, sincere, and interesting, and true to nature.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Dorothea Beale Memorial Fund.

IMMEDIATELY after Miss Beale's funeral the Cheltenham Ladies' College Guild, which represents the former pupils of the college, took into consideration the question of a memorial to perpetuate her name. A committee was appointed and communications were opened with the council and the staff of the college, such of the pupils, past and present, as could be easily reached, and a few of Miss Beale's personal friends. As a result of these communications more than £1,200 has been subscribed in sums varying from £50 to a shilling, and after careful consideration it has been decided that the memorial should take the form of :

(1) A tablet to be placed within the college, which is, of course, Miss Beale's true monument.

(2) A monument as worthy as may be of its surroundings in the Lady Chapel in Gloucester Cathedral, where she was laid to rest.

(3) A fund for the benefit of members of the staff, past or present, and of old pupils who may be in special need.

It is thought that the time has now arrived when others than those originally addressed may be invited to associate themselves with this tribute to Miss Beale's memory. There are many old pupils whose addresses the researches of the committee have been unable to discover, and many who sympathise with Miss Beale's work and revere her memory who have not been directly connected with the college. THE SCHOOL WORLD will be able to give us valuable assistance in letting these classes know what has been done and is doing in the matter, and I venture to ask you to enable us to secure that assistance.

The secretary of the committee is Miss M. M. Shewell, Ash Priors, Cheltenham. The treasurer is Miss Agatha Leonard, Ladies' College, Cheltenham. Subscriptions may be sent to the treasurer or paid to Lloyds Bank, either at Cheltenham or at 16, St. James's Street, London, S.W.

JOHN R. MAGRATH.

(Provost of Queen's College, Oxford, and Chairman of the Dorothea Beale Memorial Committee.)

Queen's College, Oxford.

The British Association's Educational Programme.

THE British Association will meet from Wednesday, July 31st, to Wednesday, August 7th, under the presidency of Sir David Gill, K.C.B., F.R.S. The president of Section L (Educational Science) is Sir Philip Magnus, M.P., and the vice-presidents of the same section are Mr. W. M. Heller and Prof. M. E. Sadler.

The chief educational discussions will be on Thursday, Friday, Monday, and Tuesday, August 1st, 2nd, 5th, and 6th. The following provisional programme will be of interest to teachers and other educationists who are able to attend the meeting.

Sir Philip Magnus in his presidential address to be delivered on the morning of Thursday, August 1st, may be expected to reflect experience gained in a long career of educational work as lecturer and examiner, superintendent and secretary of the Department of Technology of the City and Guilds of London Institute, member of the Royal Commission on Technical Education (1881-1884) and of the London School Board, member of the Senate of London University, and representative of the University in Parliament.

On the same day there will be a joint meeting with Section H (Anthropology) to discuss the measurement of development in childhood, with particular reference to the recommendations of the Physical Deterioration Committee (1904, Cd. 2175). It will be remembered that this committee found no trustworthy evidence whatever to show whether the nation was or was not progressively deteriorating, and therefore advised the collection of definite data "with a view to correct impressions, however acquired, and to get at the bedrock of fact." Sir Victor Horsley, F.R.S., will urge that the report of the committee should be put into execution by the Government. Prof. D. J. Cunningham, F.R.S., will give an account of the work of the Anthropometric Committee of the British Association, which during the past year has included the consideration of anthropometrics in schools. Dr. F. C. Shrubsall will deal with the kind of measurements which should be taken, the objects of various measurements, and some results obtained. There will also be a paper by Mr. J. Gray on some correlations which have been worked out from results of measurements, and one by Mr. E. Meyrick, F.R.S., Marlborough College, on practical difficulties.

The whole of Friday, August 2nd, will be occupied with a discussion of the Scholarship System. Invitations to contribute papers on this subject have been accepted by Miss J. Cleghorn, member of the Executive of the National Union of Teachers; Mr. A. R. Pickles, President of the National Union of Teachers; Miss S. Heron, Headmistress of the Wyggeston High School for Girls, Leicester; Mr. J. L. Paton, High-Master of the Manchester Grammar School; Mr. G. Gidley Robinson, representing Preparatory Schools; Rev. A. A. David, Headmaster of Clifton College; Mr. H. B. Baker, F.R.S., Lee's Reader in Chemistry to the University of Oxford; Prof. H. A. Miers, F.R.S., Waynflete Professor of Mineralogy, Oxford; and Prof. M. E. Sadler, Professor of the History and Administration of Education, Victoria University, Manchester.

The curricula of secondary schools will form the subject of discussion on the morning of Monday, August 5th, in connection with the report of a committee on that subject. The committee was appointed at the York meeting "to consider and advise as to the curricula of secondary schools; in the first instance the curricula of boys' schools," the members being, chairman, Sir Oliver Lodge, F.R.S.; secretary, Mr. C. M. Stuart; also Mr. T. E. Page, Profs. M. E. Sadler, H. E. Armstrong, F.R.S., and J. Perry,

F.R.S., Sir Philip Magnus, M.P., Principal Griffiths, F.R.S., Dr. Gray, Prof. H. A. Miers, F.R.S., Mr. A. E. Shipley, F.R.S., Prof. J. Findlay, and Sir William Huggins, K.C.B., F.R.S.

In recent years the scientific teaching of various school subjects has been considered, and there have been reports or discussions on the teaching of chemistry (Leeds, 1890), of mathematics (Belfast, 1902), and of botany (Southport, 1903). This year there will be a joint meeting of Section D (Zoology) with Section L on the "Teaching of Biology in Schools," to be introduced by Mr. O. H. Latter, senior science master at Charterhouse. Prof. S. J. Hickson, F.R.S., and Mr. M. D. Hill (Eton) will take part in the discussion.

On the morning of Tuesday, August 6th, there will be a continuation of the discussion started by Prof. A. Smithells at York on the possibility of extending the scientific spirit to domestic subjects in girls' schools. Among other papers will be one by Mrs. Ramsay Macdonald on "The Technical Day School for Girls." In the afternoon a discussion on "Scientific Teaching in Relation to Trade Classes and Industrial Requirements" will be opened by Mr. C. T. Millis, Principal of the Educational Department of the Borough Polytechnic Institute, London, who will deal with "Problems of Trade Education considered in Relation to our School System"; and Mr. J. H. Hawthorn, Headmaster of the Municipal Technical School, Leicester.

No technical qualification is required on the part of an applicant for admission to the association as a member or as an associate. Members pay £2 on admission, and £1 for any subsequent year in which they attend an annual meeting, without further liability. Associates pay £1 for each annual meeting they attend. Ladies are admitted on the same terms.

It may save some trouble if all inquiries as to tickets, list of hotels, and lodgings and other local arrangements are addressed to the Hon. Local Secretaries, British Association, Leicester. Communications affecting only the business of the Educational Science Section should be sent to one of the following secretaries: W. D. Eggar, Eton College, Windsor; L. Saville Laver, Wyggeston School, Leicester; Hugh Richardson, Bootham School, York; or to me.

R. A. GREGORY
(Recorder).

39, Blenheim Road,
Bedford Park, W.

Experimental Determination of Charles's Law.

The apparatus is a simplified form of that sold by Messrs. Gallenkamp and Co., and was designed to maintain the mercury column in each tube at the same temperature. The results obtained, even in the hands of younger students, are gratifying, and the apparatus can be supplied to a large number of students at a low cost.

The outer vessel A is a large-sized lamp-glass, 31 cm. long, 6 cm. wide at the top, and 8 cm. wide at the bottom. The top of the lamp-glass is fitted with an india-rubber bung, B. The most important part of the apparatus is the inner tube, C, which consists of a piece of tubing, 1 cm. external diameter and about 65 cm. long. This is bent, in the bat's-wing burner, to the shape shown. Before bending it is well to ascertain that the bore of the tube is constant, and the interior should be well cleaned. The short limb of the tube must be closed, and should be flattened by pressing on a smooth, flat surface. The difficult part in the construction of the tube is the three-way at D. This is made (after sealing the short limb and bending) by carefully heating in the foot blow-pipe flame a small portion of the bottom of the tube at

D, and then blowing gently. A small "aneurism" is formed at the heated portion of the glass tube, which, when broken carefully, will give a circular hole of about 12 cm. of tubing (preferably from the same length of tubing from which the other portion has been cut) is made hot at one end, and at the same time the circular hole in the other tube is similarly heated. Both these operations are carried out simultaneously in the foot blow-pipe flame, and if care is taken no water will condense inside either of the tubes. When both pieces of tube are "soft," the end of one is placed carefully on the circular hole of the other, and, by heating and gently blowing, a good tight joint is obtained. The joint must be carefully annealed by allowing it to cool down very slowly. The single tube at D is now fitted through a hole in the bung at E, and is fitted with a piece of india-rubber pressure tubing at F. This terminates in a thistle funnel at H, and by this means the air in C can always be kept under a constant pressure during an experiment. A thermometer (preferably one reading to 1/10ths of a degree centigrade) is fitted, by means of rubber bands, between the two limbs at K, and its zero adjusted to the top of the meniscus of the mercury when the level of the mercury is the same in both tubes. The length of the air column (as well as the temperature of the bath) at the commencement and at the end of the experiment can be read off easily by means of the thermometer scale, because, if the tube is of constant bore, the volume of the tube will be proportional to its length. Steam is passed into the water in the lamp-glass through a glass tube, M, and the temperature is kept constant throughout the water by the stirrer at N.

In order to carry out an experiment, the mercury reservoir is raised or lowered until the level of mercury in the two limbs is the same. The length of the air column is read off simultaneously with the temperature. Steam is now passed into the water until a rise of about 50° C. has been registered, the water in the lamp-glass being well stirred the whole time. The steam tube is now disconnected, the levels of mercury once more adjusted by means of the reservoir, and the length of the air column and the temperature of the bath read off.

The following example is an experiment carried out in the school laboratory with this apparatus:

Let α = the coefficient of expansion of air.

Length of air column at start = 42 divisions = L

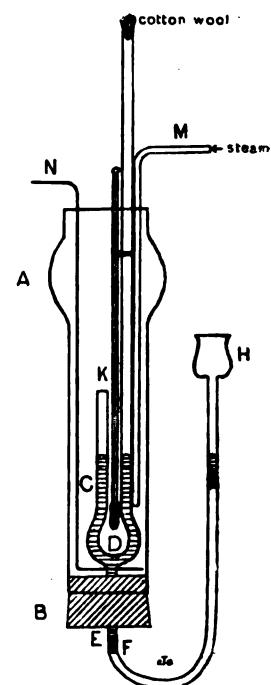
" " finish = 48.5 " = L'

Temperature of bath at start = 4° C. = t

" " finish = 47° C. = t'

Then 42 divisions of air heated through 43° C. expand 6.5 divisions

and " " " 1° C. " 6.5 " 43 "
= 0.151 division.



If 42 divisions were cooled to 0° C., the total decrease would be $0.151 \times 4 = 0.604$ division, and the length of the air column at 0° C. would be $42 - 0.604 = 41.396$ divisions. Then 41.396 divisions at 0° C. expand 0.151 division through 1° C.

$$\therefore 1 \text{ division } , \text{ expands } \frac{0.151}{41.396} \text{ divisions} \\ = 0.00365.$$

The coefficient of expansion may also be obtained from the formula

$$L' = L(1 + \alpha t),$$

$$\text{from which } \alpha = \frac{L' - L}{tL},$$

but in this case L must be the length of the air column at 0° C. and t the interval of temperature from 0° C.

$$\alpha = \frac{48.5 - 41.396}{41.396 \times 47} \\ = 0.00365.$$

The coefficient of expansion is given direct from the equation

$$\frac{L'}{L} = \frac{1 + \alpha t}{1 + \alpha t'} \\ = \frac{42}{48.5} = \frac{1 + 4\alpha}{1 + 47\alpha} \\ \text{and } \alpha = 0.00365.$$

A curve may be constructed on squared paper, having the lengths of the air column plotted as abscissæ and the temperatures as ordinates. A straight line will be obtained which should cut, when produced, the zero of volume at -273° C. (absolute zero). For this exercise the readings of the temperatures of the bath and lengths of the air column should be taken for every 10° C. In order to facilitate this, the boiling flask should be fitted with a three-way tube, one way of which is fitted with a piece of rubber tubing and a pinch-cock. The removal of the latter diverts the passage of the steam from the lamp-glass to the air.

E. T. BUCKNELL.

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Pessimism in Education.

THE discussion between Prof. Armstrong and Mr. Oliphant has gone beyond the subject of literature teaching; it has touched what is behind the teaching of any subject, and extended to the aims underlying all education. What might be called the conservative and liberal ideals are opposed, and the acquisition of knowledge joins issue with the raising of character and learning the art of living. They should join forces; but since it is the aim of most teachers, and even the tendency of the remainder, to give the first, it is well to emphasise Prof. Armstrong's views at the expense of Mr. Oliphant.

The latter has not, I think, criticised Prof. Armstrong's article fairly, for he has taken phrases and sentences from their context, and has forced them into a meaning of his own, deducing from this the idea that the article on "The Neglected Art of Plain Reading" is contradictory, and that Prof. Armstrong means ten times more than he does.

Would it not be better to see whether Prof. Armstrong's indictments against the average teacher and the teaching of English do not contain a great deal of truth—truth which others beside himself have discovered? Mr. Oliphant is quite right when he says that "if the youthful student is not attracted at the outset, there is great risk that all his later work in literature will have too much of the character of drudgery to fulfil its purpose, and that the habit of private reading will never be firmly estab-

lished," and also "a premature beginning will only dull the edge of appetite, and may even create a distaste that will never be really overcome." But so is Prof. Armstrong right in saying, "Having made this admission, he at once proceeds, however, to recommend a course of reading which undoubtedly would savour of drudgery in the eyes of every healthy boy." Mr. Oliphant actually proposes that boys and girls should study Southey's "Life of Nelson," after a year or two of Scott! I have known students of twenty or twenty-one pronounce that book "dry"—what would children of fifteen think of it? Boys would not "take what was put upon them without demur" if it was of that kind, and neither would girls, who are not such "dear obedient creatures" as Prof. Armstrong seems to think, for which let us be thankful.

What is it we do need to aim at in literature teaching? At the back of all the subordinate aims is there not the prime one of inculcating a desire to read the best, and the wish to go on with it when school days are over? The books borrowed from libraries show that this aim is but feebly carried out, for the most popular are far from the best. The reason for this is twofold: there is a dislike for good literature or there is ignorance regarding what is the best to read. The impression that good literature is dull and only fit for school reading is caused by prematurely forcing what would at a later stage be appreciated and enjoyed. Mr. Oliphant would do this by his selection, and in no study is it so inexcusable, for it frustrates the very aim of literature teaching. All children like stories; therefore the beginning can be with them. Delight in a story will lead to enjoyment of beauty in language and thought, and thence to discussion on style and opinions. In this later stage the teacher has the opportunity of instilling more than a love of literature. He can guide thought, check conventionality, and inspire ideals. It all depends on the teachers, in spite of Prof. Armstrong's opinion that they do too much and stand in the way. They cannot do too much so long as the pupil does it too, nor can they give too much. But they must have it to give, and that is where Prof. Armstrong is right in his so-called pessimism—the majority have it not to give. They have not learnt the value of individuality, and walk in the paths of convention. Prof. Armstrong recommends the "Upton Letters" to striving teachers; let there be added to that a far more inspiring book, Kappa's "Let Youth but Know."

A guide is necessary to the young traveller in the realms of reading, but he must feel that the guide is trustworthy, for if he is decoyed into reading something "dry" he will not follow again. No book that is read in school should be, or become, dry; if it does, something is wrong somewhere. When it is finished the readers should be glad they have read it, and wish for more like it. An informal discussion at the end of the year on the books read will show what has been appreciated and give limits for the next year's work.

Prof. Armstrong's advice to boys and girls to read practically anything and everything, and in time they will learn to separate the wheat from the chaff, is rather too wide. Most would separate the two in time, but some chaff in the shape of novelettes and penny dreadfuls will have left its influence behind, and it would remain even after the cause had become nauseous. Mr. Oliphant is right when he says that "even if all young people had ready access to a well-stocked library, the greater number would rarely enter it except under compulsion, and of those who did venture inside, the majority would be satisfied with the most frivolous books they could find,

and would never develop a taste for any other class of literature unless through some outside influence"; but he does not suggest the right influence.

Ignorance of what is best is often the cause of its neglect, and many young people with an innate taste for beauty of thought and expression gradually lose it after school days for want of using and satisfying that taste. Besides recommending authors and books, a list of the books which everyone ought to have read by the time he or she is twenty-one would be useful. It would be a guide to after-school reading, and form a starting point for further study.

Of course, opinions will differ as to the books in the list, but the following is an attempt:

Fiction.

Dickens, "David Copperfield," &c.; Scott, "Ivanhoe," "Waverley," "Kenilworth," &c.; Goldsmith, "The Vicar of Wakefield"; C. Brontë, "Jane Eyre"; Kingsley, "Water Babies," "Yeast," "Hypatia"; Thackeray, "Vanity Fair," "Esmond," &c.; George Eliot, "Adam Bede," "Mill on the Floss," "Silas Marner," &c.; Reade, "Cloister and the Hearth"; Meredith, "Ordeal of Richard Feverel"; Macdonald, "Robert Falconer."

Poetry.

The poems in Palgrave's "Golden Treasury of Songs and Lyrics," parts i. and ii.; Shakespeare's Plays.

Essays, &c.

Drummond, "The Greatest Thing in the World"; Lamb, "Essays of Elia"; Holmes, "Autocrat of the Breakfast Table"; Carlyle, "Heroes and Hero-worship"; Emerson, "Essays"; Ruskin, "Sesame and Lilies" (for girls especially).

E. M. WHITE.

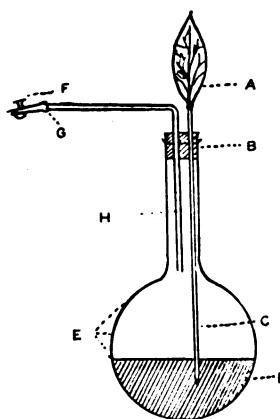
Experiment to show the Existence of Openings on Leaves.

THE following experiment, which I have used for showing that the external coating of a leaf must be pierced by openings, may be of interest to some of your readers. The apparatus is shown in the accompanying figure. The leaf (A), which must be quite undamaged, is sealed by its petiole into a piece of glass tubing (C) drawn out to a fairly fine point and dipping into water (D) contained in the flask. Through the two-holed rubber stopper (B) passes the tube (C), and a second piece of tubing (H) bent at right angles, fitted with a piece of rubber tubing (G) and clip (F).

On exhausting the air above the water, a stream of bubbles rises from the end of the tube C to the surface of the water. By continuing the process of exhaustion, the stream of bubbles may be produced indefinitely, and hence, since all the joints of the apparatus are air-tight, the experiment shows that there

must be openings in the surface of the leaf. Further, on fastening the clip, the size of the air bubbles, which still appear, gradually diminishes, until finally the bubbles themselves disappear. The explanation of the latter part of the experiment is a useful exercise on pressures.

The County School, Barry, Glam. E. H. DAVIES.



English Conversation Assistants in German Schools.

I WISH to direct the attention of your readers to the scheme, arranged by the Board of Education and the Prussian Minister of Education, by means of which Englishmen can be appointed "conversation assistants" in first-rate German schools.

I take this upon myself because it was officially stated a few days ago in the Prussian House of Representatives that, in consequence of the fact that Englishmen had not availed themselves of this opportunity in sufficient numbers, it was proposed to throw it open to Americans also. As this can only arise through prevalent ignorance of the scheme among English teachers and students, may I refer all interested in the subject to the Director of Special Inquiries, Board of Education Library, St. Stephen's House, Cannon Row, Westminster?

The arrangement is intended for those who wish to study the German language, but I stated frankly that with me German was a secondary consideration; I wished to study in a German university. Every facility was given me, I was treated by the staff and director of the school with the utmost politeness, and my "conversations" have been a continual source of interest and recreation. They average two hours a day, and the uniform salary paid is £5 10s. a month.

Hoping Englishmen will take pity on the poor German youth and save him from the impending peril of a nasal accent.

ERNEST BOWMAN LUDLAM.

Karlstr. 17, Kiel.

The Aim of Modern Language Teachers.

No one would nowadays maintain that to train boys for written tests is the aim of modern language teachers.

This passage occurs in an excellent paper by Mr. F. M. Vipan in your issue for May, 1907. Is the writer justified in making this easy assumption? The requirements of external examiners absolutely necessitate interminable paper practice on the part of the class. Even H.M. Inspectors (who, whatever they may be in theory, are also in practice examiners) attach the utmost importance to rigid grammatical accuracy, such as can only be attained by very extensive paper practice. Now, the average foreign language master knows that his bread and butter depends—next to his disciplinary powers—on his power of pleasing the external examiner and the Government Inspector. In such circumstances I venture to think that Mr. Vipan has jumped somewhat too hastily to his apparently self-evident conclusion.

SIGMA.

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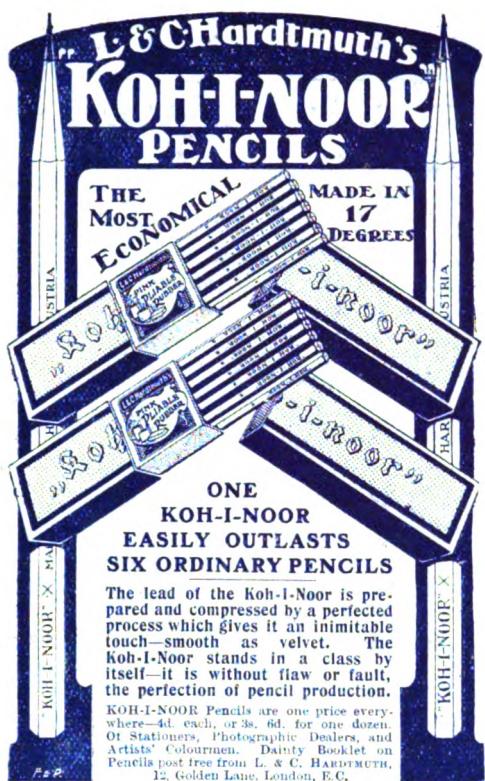
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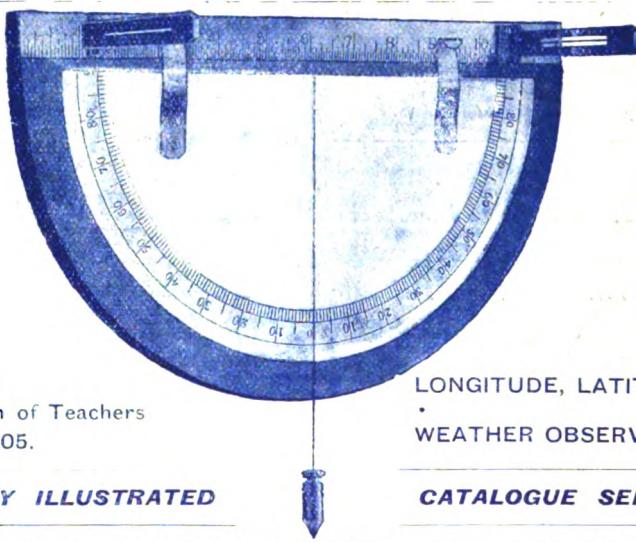
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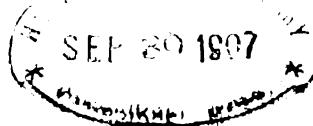
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JULY, 1907.

SIXPENCE.

THE APPROACH TO LINEAR AND QUADRATIC EQUATIONS.

By J. M. CHILD, B.A., B.Sc.

Lecturer in Mathematics, Technical College, Derby.

THIS paper is written in the hope that it will be useful in suggesting means for surmounting some of the difficulties, and as a warning against some of the pitfalls, which beset the path of the beginner in algebra. These last three words form the very epitome of all the pitfalls. There should be no such thing as a "beginner in algebra." Algebra should be so treated—as generalised arithmetic—that the boy should be well forward on his way before ever he realises that he is doing anything else but arithmetic. If "substitutions" are taught from formulæ used in physics, engineering, and other branches of science—I have found a lesson on arithmetic and geometric progression a good introduction to algebra!—symbols will rapidly take on a real "live" meaning. A lesson on arithmetical L.C.M.—the method used being, of course, that of "prime factors"—should be followed by, or rather merged into, one on indices, powers, and logarithms treated graphically. A lesson in arithmetic on the meaning of "one-and-a-half times six," in which the convention that $a \times b = b \times a$ for all positive numbers is assumed as the fundamental law of multiplication—no boy ever yet really understood the "operator" explanation—should be followed by the proof, by areas of rectangles, that

$$(a-b)(c-d) = ac - bc - ad + bd,$$

so long as $a > b$, $c > d$, the minus sign having its simple arithmetical meaning. Hence, assuming this formula as the fundamental law for multiplication of all quantities, the "rule of signs" follows immediately.

I need not multiply examples further; I have already outlined such a scheme as this in these columns.¹ It may be worth mentioning that on the Continent text-books are in use in which arithmetic and algebra are worked together in parallel. That such a method is, unfortunately, not in general use in England is, however, manifest from

the reports of various examiners. In spite of the recent reform in teaching elementary mathematics, and the general introduction of graphical illustrations, algebra is still a thing of symbols, signs, RULES, and that magical letter of mystery, x . In this connection I feel very strongly that Mr. Hall, in his letter to THE SCHOOL WORLD of April, 1905, strikes at the very root of the matter. Graphs are too often taught—and frequently badly at that—too much for their own sake, and too little for their legitimate purpose—illustration, suggestion, and verification. A question on graphs is bad (with a big B) if the curve is the sole end and aim: the curve should be simply the means of illustrating and clearing up some difficult point, such as interpolation; of suggesting new ideas, such as the algebraical meaning of a negative quantity, the rate of change of a function, the number of roots of a quadratic, and how they change from two real unequal, through two equal, to two imaginary quantities; as a method of approximation to the roots of equations, the ordinary algebraical solution of which is not within the boy's grasp, or as a rough check on roots already obtained, and so forth; but always as the means, and not as the end.

At no period of the beginner's progress does his future mental agility depend so much on teacher or text-book as it does when he starts "equations." Oh, that a Dictator should arise with authority, who would absolutely and unreservedly condemn to the flames all beginners' text-books having in them soul-destroying batches of equations "for practice," and consign to some barren island all teachers who set beginners to solve an equation, which has not been obtained, with or by the class, from a problem! Equations would then possess a lively interest for a far greater percentage of a class, especially if one were unconventional enough to label a batch of problems "Puzzles." If it is felt that any elementary equation should be worked out as a "type," and half-a-dozen problems of sorts, embodying the idea of this type, cannot be concocted, then either the equation as a general rule is valueless as a type, or the teacher—ought to be teaching some other subject.

These mathematical puzzles can be started quite early, with such a "problem" as "A number

¹ "Algebra as Generalised Arithmetic" (THE SCHOOL WORLD, June, 1905).

is less than four times itself by 12; find it." The working to be as follows :

$$\text{Number} = 4 \text{ times number} - 12$$

Hence, adding 12 to both sides of the equation—which does not alter the equality—
(Refer to axiom.)

$$\therefore \text{Number} + 12 = 4 \text{ times number}$$

$$\therefore 12 = 3 \text{ times number}$$

$$\therefore 4 = \text{the number}$$

$$\text{or the number} = 4.$$

The last step will, if any explanation is necessary, have to be explained as the reverse of multiplication, multiplication itself being only a repeated use of the axiom, "If equals are added to equals, the sums are equal."

The explanations necessary in this simple "puzzle," involving all the elementary rules for equations, may well take up a whole lesson. Especially should the disappearance of the 12 from the right-hand side of the equation and its appearance on the left-hand side with its sign changed be shown to depend on the axiom quoted above, and not on some arbitrary RULE. The next lesson might suggest the use of n , the initial letter of number, as a sort of mathematical shorthand; and a few similar "puzzles" should be worked out, with the assistance of the class, in words and in symbols, the solutions being set side by side, step by step with one another, on the blackboard, the fact that n is a number being insisted on continually. Later, take such a problem as "The sum of two numbers is 17, and their difference 3; find them." Starting with—

$$\text{Greater number} + \text{smaller number} = 17$$

$$\text{Greater number} - \text{smaller number} = 3,$$

suggest g , s as abbreviations for "greater number" and "smaller number" respectively, and rewrite—

$$g + s = 17 : g - s = 3.$$

Work out (i) by substituting $g = s + 3$ from the second equation in the first, and find s , and hence g , and (ii) by adding and subtracting the two equations obtain g and s . Full explanations must be given, but do not tell the boy he is doing "simultaneous equations." Insist on the problem being properly finished off with a statement, such as—

Hence the numbers are 10, 7.

and let the result be verified immediately in the problem and not in the equation.

Proceeding in this way, always considering the working out of an equation as the means and not the end, the interest of the class will be stimulated; moreover, the innate fighting spirit of the boy will be aroused by posing an equation as something to be tackled and licked, whilst the master sees fair play. To my mind, there is nothing more vicious and disastrous than showing a boy the method of solving a certain type of equation, and setting him ten or a dozen "like it" for homework. Let each problem or equation or what-not be different, if only in some small detail, from anything done before, so that there is some necessity for thought, and not a possibility of mere mechanical manipulation of

unintelligible symbols. I give an example of some of the most useful types of equations paired with a problem from which it is derived.

(i) *Problem.* "Find four consecutive numbers such that their sum is six times the least."

$$\text{Equation. } x + x + 1 + x + 2 + x + 3 = 6x.$$

(ii) *Problem.* "The sum of two numbers is 55; one-fifth of one and one-sixth of the other together make 10. Find the numbers."

$$\text{Equation. } \frac{1}{5}(55 - l) = 10.$$

(iii) *Problem.* "What is the price of eggs per dozen when two more in a shilling's worth lowers the price one penny per dozen?"

$$\text{Equation. } \frac{144}{x} + 2 = \frac{144}{x-1}; \text{ multiply across by } x(x-1).$$

Similar problems, giving two and three simple simultaneous equations, can easily be constructed. The following is especially noteworthy, as bringing out a very general difficulty for beginners.

(iv) *Problem.* "A man sets out to go from London to Derby and back. He walks to Bedford (45 miles), where he obtains a bicycle and cycles the remaining 75 miles to Derby. On returning, he walks as far as Leicester (30 miles from Derby), and having sent on his machine from Derby to Leicester by train, he cycles the remaining 90 miles to London. It takes him 17 hours from London to Derby, and 14 hours from Derby to London. Find his rates of walking and cycling."

$$\text{Equations. } \frac{45}{x} + \frac{75}{y} = 17 \dots \dots \dots (1)$$

$$\frac{30}{x} + \frac{90}{y} = 14 \dots \dots \dots (2)$$

The usual text-book method is that of "changing the variable"; but, besides being confusing, it frequently happens that the beginner gives the values obtained for the new variables as the solution, and not those of the old variables, their reciprocals. This is avoided—and the method is valuable in other ways—by teaching the boy to work out the equations as they stand with the

variables $\frac{1}{x}$, $\frac{1}{y}$. Thus—

$$45\left(\frac{1}{x}\right) + 75\left(\frac{1}{y}\right) = 17 \dots \dots \dots (1)$$

$$30\left(\frac{1}{x}\right) + 90\left(\frac{1}{y}\right) = 14 \dots \dots \dots (2)$$

$$\text{Multiply (1) by 6} \therefore 270\left(\frac{1}{x}\right) + 450\left(\frac{1}{y}\right) = 102$$

$$\text{Multiply (2) by 5} \therefore 150\left(\frac{1}{x}\right) + 450\left(\frac{1}{y}\right) = 70$$

$$\therefore 120\left(\frac{1}{x}\right) = 32$$

$$\therefore \frac{1}{x} = \frac{4}{15} \text{ or } x = 15$$

$$\text{Hence from (1)} 75\left(\frac{1}{y}\right) = 17 - 12 = 5$$

$$\therefore \frac{1}{y} = \frac{1}{15} \text{ or } y = 15$$

\therefore Speed of walking is $3\frac{4}{5}$ miles per hour and speed of cycling is 15 miles per hour.

It will be noticed that problem (iii) results in a quadratic equation. I consider quadratics are

hopelessly out of place in most text-books. It cannot be insisted too strongly that the beginner should not have the slightest idea that a solution by formula exists. The working out of the general case should be relegated to its proper place, the first section of a chapter on "Theory of Quadratic Equations," when the equation should be quoted in the form—

$$ax^2 + 2bx + c = 0.$$

If the general equation is thus left out of account (and consequently there will be no formula), there is no earthly reason why the boy should not proceed straight on to quadratics as soon as he has acquired decent facility in symbolic expression by doing a considerable number of the easy problems suggested above, *provided he has a fitting preparation*. This preparation should consist of lessons on factors:

(1) Monomial factors, &c.

(2) Types, $(x+a)^2$, $(x-a)^2$, $(x+a)(x-a)$.

(3) Completing the square, and writing an expression as the difference of two squares.

(4) Type $x^2 + 2ax + b$, by "difference of squares."

This should be merged into a lesson on binomial multiplication, by verifying the product of each pair of factors mentally, and from this the usual "guess" method for this type should materialise gradually.

(5) Type $ax^2 + 2bx + c$, by reduction to the preceding type, by the substitution $y=ax$.

The boy, it will be found, will rapidly assimilate from numerical examples the fact that—

$$\begin{aligned} & 36x^2 + 17x - 35 \\ &= 36^2x^2 + 17 \times 36x - 35 \times 36 \\ &\quad 36 \\ &= y^2 + 17y - 35 \times 36 \\ &\quad 36 \\ &= (y+45)(y-28) \\ &\quad 36 \\ &= \frac{(36x+45)(36x-28)}{36} \\ &= \frac{36x+45}{9} \times \frac{36x-28}{4} \\ &= (4x+5)(9x-7) \end{aligned}$$

becomes

$$\begin{aligned} & 36x^2 + 17x - 35 \\ &= \frac{(36x+?)(36x-?)^2}{36} \\ &\quad \left\{ \begin{array}{l} \text{where the numbers required are such that} \\ \text{product} = 36 \times 35 \\ \text{difference} = 17 \\ \text{greater has a + sign} \\ = (36x+45)(36x-28) \\ \quad 36 \\ = (4x+5)(9x-7) \end{array} \right. \end{aligned}$$

Thus perhaps what may be called the "pons asinorum" of algebra is crossed easily and systematically. The usual "criss-cross" style is an abomination.

Of these five lessons, (1) will probably have been taken with arithmetical prime factors; (2) and (3) together, with illustrations by areas of rectangles, as an outcome of the determination of the "rule of signs" by the method suggested above; (4) and (5) should be introduced by the discussion of problems leading to quadratics, similar to problem (iii) above. That is to say, instruction in factors and quadratics should go hand in hand: the quadratics being obtained from actual problems will all have real rational roots; the discussion of literal equations both simple and quadratic, and quadratics having irrational or imaginary roots being deferred, and also all

other cases of factors being left over until the idea of a "function" is understood, and the Remainder Theorem tackled.

By this method, the boy is taught that each root of an equation corresponds to a linear factor; in those cases where "factors won't come out" easily, his training in reducing trinomials to the difference of two squares leads naturally to the ordinary method of solution by forming the numerical square on the right-hand side of the equation, and *explains the double sign*; there will be no omission in pure quadratics, like $x^2 = 25$, of the root $x = -5$, if the boy is taught to solve it as—

$$x^2 - 25 = 0, \therefore (x-5)(x+5) = 0;$$

and there will never be a possibility of "dividing across by x " and omitting the root $x = 0$.

In every case the verification of the result *from the problem* should follow; and the "inadmissible root" should be shown to satisfy the problem as well, if the conditions are slightly altered, such as supposing in problem (iii) above that one could pay -8d. a dozen for eggs. A good test for the meaning of the minus sign this!

Of course, there should be graphical illustration of quadratics, not only by plotting

$$y = ax^2 + 2bx + c,$$

and finding the values of x for which $y = 0$, but also by plotting on the same diagram $y = ax^2$ and $y = 2bx + c$.

Simultaneous quadratics may thus be introduced, and the intersections of

$$(1) \quad ax^2 + 2bx + c = 0 \quad \text{and} \quad (2) \quad a'x^2 + 2b'x + c' = 0 \\ y = mx + n \quad y = m'x + n'$$

shown, to give explanations of the number of roots. In (2) it may be shown that the substitution $y = mx$, where m is variable, is equivalent to sweeping out space by a line through the origin rotating through two right-angles, and the values of m found are those for which $y = mx$ cuts both curves at the same point, and hence give from the equation of either of them, by (1), the intersections of the two curves. I strongly oppose the elegant, but useless, solutions by symmetrical expressions of the types $x+y$, $x-y$, xy , and x^2+y^2 . Give a boy such a problem as "The sum of two numbers is 8, and the sum of their squares is 40; find them," and ten chances to one you get the solution—

$$\begin{aligned} x^2 + y^2 &= 40, \quad x+y=8 \\ \therefore x^2 + (8-x)^2 &= 40 \\ \therefore x^2 - 8x + 24 &= 0 \\ \therefore (x-2)(x-6) &= 0, \text{ &c.}; \end{aligned}$$

or even with the equations $x^2+y^2=25$, $xy=12$ you get

$$\begin{aligned} x^2(25-x^2) &= 144 \\ \therefore x^2 - 25x + 144 &= 0 \\ \therefore (x^2-9)(x^2-16) &= 0 \\ \text{or } (x-3)(x+3)(x-4)(x+4) &= 0, \text{ &c.} \end{aligned}$$

And this—besides the way in which it shows up the number of roots—I contend is shorter, more straightforward, and better calculated to enhance the boy's powers of solution than any "dodge"

that was ever invented, no matter how beautifully symmetrical its appearance.

In my opinion, the whole cause of failures, that do happen in algebra to really capable boys, is in general no fault of the boy's or of the teaching powers of his master, but of the stereotyped method of the "cut-and-dried-sections" principle on which text-books are usually written. In all cases the whole of the algebraical theory given to a boy in his first year at least should be that which is demanded for and introduced by the solution of problems.

THE PROBLEM OF MORAL TRAINING.¹

By J. L. PATON, M.A.

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OF all the many inquiries to which Prof. Sadler has set his hand there is none larger and at the same time more delicate than this on moral training, none which, if successful, will have such far-reaching results. There is no quest so hard as that in search of the philosopher's stone which will act on character, and it behoves all teachers, therefore, to give the trusty Galahad who undertakes it the best fruit of their experience and their thought to help him in his quest.

The question is as large as education itself, and education is the largest word in our vocabulary; it is not, therefore, possible to do more than touch the fringe of it. The first question suggested is the comparative ethical value of school studies, and at once in seeking to answer it, one finds how intensely interesting is the question that it raises. Speaking for myself the ethical content is of more value than that of science or mathematics or modern literatures, but a boy working willingly and successfully at a scientific curriculum is in a healthier moral state than a boy who is grinding reluctantly and without success at the Latin gerunds. The answer to the question depends on the attitude and aptitude of each individual; that work is ethically best at which a boy works with joy, with the feeling of accomplishment and an open-eyed sense of growth. For this reason, when other conditions are the same, boys trained on the "modern side" are not, as such, inferior in their standard of conduct or less responsive to the higher motive. Again, there is a school which suggests that the pre-eminently ethical subjects are English literature, history, and geography. Without for a moment denying the ethical value of these studies, it ought not to be thought that the value of classics or mathematics is merely intellectual or inferior in ethical value. The very fact that the boy has to wrestle with hardness in these disciplinary subjects creates the strenuous atmosphere in which moral fibre is tested and grows: it is the toughness of these "warp-studies" which gives consistency to the moral ideas suggested by literary or historic subjects and makes them serviceable. An illustration from "faked"

algebra sums shows how, to produce honest work, a pupil has to exert not only his mind but his will; he has to set his face against inborn *vis inertiae*, against temptation to "fake" from within and to seek illegitimate help from without. No word is said about honesty; the better the master, the less is the likelihood of any preaching; but the thing itself, "truth in the inward parts," is learned by practice. Similarly, the football-field, with its knocks and the occasionally exasperating blindness of the referee, is a better field for teaching self-control than the pretty story of Bucephalus with the moral pill annexed. The smaller virtues of school life—punctuality, accuracy, neatness; qualities sometimes slightly referred to as "school virtues"—are in reality great life virtues exemplified and enforced in small matters. Neatness is in essence a form of respect for work, for duty, and the person to whom it is discharged. Accuracy is our duty to truth in small matters. Punctuality is one of the ways we show thought for other people. These things sound petty and insignificant and commonplace by the side of Bucephalus and the great deeds which resound through history. But what we have to learn is that the opportunities in life for doing great things are few and far between, but the opportunities for doing good things lie thick-strewn upon the beaten path of our daily lives. Moral practice is the first important element of moral training.

The second is environment. "To be born and framed into virtue and to grow up from the seeds of nature," as Sir Thomas Browne phrased it, a child must have all the advantages of a good site, beautiful buildings, bright and airy, well-decorated rooms, plenty of music and song, a well-planned ordering of praise and blame, rewards and punishments, genial and sympathetic human relationships. By these things many lower tendencies of human nature may be killed by atrophy, the higher tendencies may be fostered and fortified with wondrous potency. Here the school, at any rate the day school, plays a subordinate part to the home; but, instead of being discouraged by that, it ought to be a stimulus to teachers to secure more than they do the sympathy and co-operation of parents by getting them into living touch with the aims and methods of the school, and the elementary-school teacher should possess a far greater measure of control than he does at present over the out-of-school conduct of his pupils. The positive influences of environment are invisible and incalculable, and all the more potent, if the scholars themselves take some part in creating or improving their environment. Beautiful surroundings are much, but scholars who are not entirely passive, but themselves help to make their surroundings less ugly, are on the upward line; for endeavour is of the essence of morality.

The third element in moral training is the imparting of moral ideas. Here the *questionnaire* suggests that something more systematic can be done either (a) through history and

¹ An abstract of the Presidential Address to the Teachers' Guild, June 15th, 1907.

literature, or (b) through Bible instruction, or (c) a graded system of moral lessons on non-theological lines. With regard to (a), history must be taught as history, literature as literature: the fisherman who hides behind a tree is most successful. The word "definite" in regard to the Bible is explosive; the greater the measure of "definiteness," the less, as a rule, the measure of tolerance or charity. The Bible stands in secondary schools unchallenged; it contains all that we need for right living and all that we know of the great "not ourselves." Let it remain unsystematised, lest we lose it altogether. As to (c), the idea of direct moral instruction is not new, but it has not proved itself efficient. There are occasions when direct inculcation of moral duty is in place—when a boy goes to a new school; at the end of term, especially if he is leaving; when new prefects are appointed and installed; on some special commemoration either national or peculiar to the school, like Founders' Day, when all look for it, feel it to be right, and are ready to be impressed; when some offence has occurred which needs to be set out in its true colours, or seems to be due to moral illusion, or is dishonouring not only to the individual offender but to the good name of the whole community to which he belongs. On other occasions we speak privately and individually. But moral instruction as a regular subject of curriculum so many times a week on the time-table involves grave risks.

First, it makes character a separate subject instead of its being beneath and acting through all subjects and all school activities. This involves subtle danger both for teacher and taught. The teacher who has bought his handbook for 4½d., and has fired off his lessons according to prescription, is in danger of thinking that he has done all that belongs to his duty of moral training: the pupil is apt to think that, if this hour is specially moral, then other hours are not specially moral. Moral training must be a matter of diet, not doses.

Secondly, it is not hard to convey by such lessons any amount of fine ideas about morality; pupils may write finished essays on courage, but are they therefore brave because they can talk about it? Many boys have most accurate information about cricket and football, but their skill on the cricket-field (if they ever figure as performers) is usually in inverse proportion to their powers of talking cricket shop.

Thirdly, these pushful and insistent methods defeat their own end: they provoke in the more vigorous minds either a whole host of contrariant ideas or else a sense of boredom and indifference. The best suggestion is auto-suggestion: in morals as in humour, it spoils all to be too explicit.

Fourthly, even if the lesson gets home and translates itself into action, the lesson taught may not be the right one for the particular period of a child's development. Immature children have not adult virtues. Charles Lamb "in the coxcombry of taught charity" gave away his cake to the unseasonable pauper and "walked on in the pride

of an evangelical peacock." Better if he had been allowed to eat at any rate half that cake.

Fifthly, unless thought and emotion are translated into actual endeavour, they do mischief. Hence the subtle danger of much novel-reading or theatre-going, however good. The fine lady weeps over the sorrows of the hero in the theatre and works off her feelings in tears with never a thought for her coachman who freezes in weariness outside. It is not enough to have the idea, to have it well in the focus of the mind and reinforced by ideas of advantage. All this may be true of the boy who lies in bed in the morning after the hour has struck for getting up. What he needs is to be "skinned." To know is not enough, the assent of the mind is not enough; the consent of the will is what is needed for action. Moral lessons must be lived to be understood, must be repeated until they become habits. Passive impressions grow weaker by repetition, active impressions grow stronger. Light comes as the reward of obedience, for, though right thought does not always produce right action, right action always and unerringly produces right thought. Take patriotism, for instance. The love of country does not need to be engendered; it is there to start with; no instructions or directions foster it: love does not grow by precept. We must see our country, feel it, breathe it in, and do something for it.

Lastly, one's feeling on looking over the Moral Instruction League's syllabus is best expressed by the words of a shrewd headmaster, who said on reading a set of flamboyant testimonials, "There is a strong smell here of something left out." The syllabus is on non-theological lines, i.e., in plain English, it shuts out God. It leaves out the ultimate sanction of all ethics and the only power by which conduct can be made ethical. Conscience is the voice of God within; the chief end of man is "to glorify God and enjoy Him for ever." Man without this faith cannot adjust rightly his everyday relationships, whether personal, domestic, or social, without reference to God, any more than he can explain the orbit of the earth and the process of seasons without reference to the sun. Man without this faith is an over-developed ape, a mere caretaker on a globe destined to sterilisation and destruction. Morals break down without religion, as surely as religion breaks down without morals. There never was a more promising movement for moral reform than that of the second century A.D. It had begun before Marcus Aurelius: when he came to lead it and himself delivered to the Senate a series of addresses on morals, it seemed as though the movement were backed by all the resources of the civilised world—wealth, learning, culture, genius, eloquence, the patronage of supreme political power. But it was a failure. Christianity had none of these resources; it had the whole world, civilised and uncivilised, against it, but it carried the day against all odds, and opened a new epoch and a new hope for the human race. Why? Because it had behind it, and beneath it,

and within it, the Omnipotence of the Infinite; because it found the fulcrum for its lever in a world outside and beyond, therefore it had power "to uplift the earth and roll it on another course." This great inspiring idea must be embodied in a person, be "made flesh." Religious men and women are out of all comparison more important than any syllabus of religion, however perfect. The unseen factor that counts for most is the radiation, not of personality, but *through* personality, of a higher, holier power not ourselves. When all we have said or done, our cleverness, our academic success is forgotten, "what we were like" will be remembered. A small boy at Rugby under Arnold, asked what he could remember of the Doctor, said: "I remember there was a row in a study, drinking, or something of that sort; it was reported to Arnold, and he went along to stop it. I hid behind the door to watch him as he came back along the passage. I remember the look in his eye. It taught me for the first time what sin was."

Not, therefore, what we say, or even so much what we do, but what we are is the thing that endures—the ultimate lesson which each one of us teaches. If there is in us this quality, which in Arnold was called "moral transparency," then, like Arnold, we shall be backward to speak much about those secret things which rule the heart. It is not needed, and all the great vital processes are secretive. We shall be backward to speak, but not backward to love. Love wins love, and nothing is so educable as love. Nor has anything so many incalculable opportunities to impart itself: with every greeting, every parting, every chance word we toss each other as we pass, each glance of the eye, it is given or it is withheld. Love radiates into other natures as surely as any physical emanating rays; it is no more to be withheld than any other natural force. It is because our profession gives more chances and channels for it than any other that it is the noblest profession of them all. Magnify the office: it is by magnifying the office that we keep our personality in the right and humble frame. There is always the danger, when one speaks of personality, that folk should think we wish to stamp our personality upon the child. None of us, it is to be hoped, has reached that pitch of self-complacency. The higher our ideal, the more likely are we to know our own littleness and to place our hope and strength in the great Omnipotent who makes for righteousness, the anchor that is within the veil, and that

High Light whereby the world is saved.

The Tutorial Physics. Vol. iii. *A Text-book of Light.* By R. Wallace Stewart. Fourth edition. Revised by J. Satterley. 346 pp. (Clive.) 4s. 6d.—This edition contains a full treatment of the elements of geometrical optics. A number of simple experiments on the fundamental parts of the subject are described, and numerous problems are inserted at the end of each chapter. The volume can be recommended for the use of intermediate students.

TEACHERS' PENSIONS.

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I.

THE principle of providing pensions for persons engaged in public work is recognised in all countries; in England one of the great attractions of the Civil Service is the pension. This principle has been applied in other countries to all teachers, from the university professors to the teachers in the kindergarten schools—but of this, more later.

Argument appears unnecessary to show that the work of the teacher is work of national importance. The saying that "Waterloo was won on the playing fields of Eton" has become almost proverbial; but it is no less true that our industrial victories must be won in our elementary and secondary schools. These schools must be improved and modernised if we are to hold our own against the industrial forces of other countries. America alleges that her industrial victories are won in the manual training schools. "An industrial epoch has called for men schooled on an industrial basis, not educated merely academically, and has extended to them the management of great enterprises, the custody of electrical and mechanical movements that go hand in hand with the headlong progress of the times. . . .

"To those who can answer the call, success is spelled out in large glowing letters. Their salaries are large, their influence great, their prospects for controlling big enterprises bright. It is the manual training school boy, trained free in almost every American city, who is filling this need. Everyone desires to employ him. He is self-reliant, accurate, quick of thought and action, has big ideas, and, better still, knows just how to execute them."

If then we are to maintain our present relative standard, and much more, if we are to improve our schools so that their products can easily outstrip such rivals, we must attract into the teaching profession more men and better men and women.

The effect of commercial prosperity is to raise the receipts of those men whose work is directly productive. The schoolmaster is thus about the last to be affected by any increase of trade or improvement in commerce. The teacher has to wait for his harvest—not for the summer or the autumn of the year—but for the fruit time of the life of his pupils, for many years in fact, the very flight of which clouds the effect of his work; and during which so many causes, so many circumstances exert their influence that it is very doubtful whether he ever gets truly credited with the real value of his contribution—be it good or ill—to the finished product.

In the nature of things he cannot be paid as others are, according to the effect of his labours, and he is not. In the West Riding, a district perhaps as keen on education as any, the average yearly salary of assistant masters in secondary schools is £150 8s. 11d.; leaving out the four

leading schools in the district it is but £116 os. 6d. The average salary of headmasters in the same district is £518 10s. In East Anglia, the average salary of 86 men in 20 schools is £103 6s. And these are not exceptional districts. For, of 1,150 men in 200 schools (including 251 men in 10 first-grade schools), the average is only £135 per annum.

Nor is this all: the prospects of the assistant master are no more attractive than his salary. But one in six can ever hope to attain to a headmastership; but one in twelve can hope for a headship worth £300 a year or upwards, while only one in thirty can ever expect to reach the princely salary of £500 a year! Certainly these figures were compiled as long ago as 1902. Since then matters have improved somewhat. In London, thanks to the L.C.C., salaries and prospects are better than they were; but in the country-schools the improvement is hardly perceptible.

In the *Contemporary Review* the fate of sixty assistant masters was traced. "Four have schools of their own, and eight have become curates; among the others are a barrister, a solicitor, a gold digger, a professional tenor, a bookmaker (not literary), and a grower of tomatoes. Two are out of work and cannot find any; one poor old man shot himself; twenty-four only remain as they were, and fifteen have completely disappeared, leaving no trace." On this last class some light may be thrown by a paragraph announcing that "a skilful mathematician and a poet of no mean order, formerly headmaster of Rivington Grammar School, died at the age of seventy-seven in Bolton Workhouse." A similar case was reported in the Press at the end of April this year.

These particulars show how sorry a trade teaching is, and offer a sufficient reason for the present deficiency of qualified men. They further show that it is impossible under present conditions for schoolmen to live cultured lives, moderately free from sordid cares, to be examples of cheerfulness and contentment, family men of the best type, fit companions for youth in its most impressionable age. No man from a comfortable home with a university training can marry a wife from his own station, bring up a family, and make suitable provision for it, out of a yearly stipend of £116 os. 6d., or even of £150 8s. 11d.

It is apparent then that some financial aid must be given to make the profession of teaching as attractive as others; to keep good men from leaving it for other occupations; to make it a possible one for cultured folk; to give at least a living wage; and to attract those worthy men who are now so much needed. One way of doing this and of suitably rewarding old teachers, and of removing old teachers to make way for young ones, is to establish Pension Schemes.

The Government spends a considerable sum—some eight millions annually—on Army, Navy, and Civil Service pensioners, who after ten years' service are entitled to ten-sixtieths of their salary, one-sixtieth being added for each additional year's

service up to forty. Thus, a Government official, if he has reached the age of sixty, or if he is certified by a medical man to be permanently unfit to perform his duties, retires on as many sixtieths of the salary and emoluments of his office as he has served years; e.g., after forty years' service on two-thirds of his salary.

All the L.C.C. employees receive retirement allowances. In its new scheme the Council proposes, in the event of retirement after ten years' service, either through ill-health or old age (sixty-five), or after sixty on completion of forty years' service, an allowance of one-sixtieth of the official's average salary and emoluments throughout his period of service up to a maximum of forty-sixtieths, provided that in case of retirement through illness no such allowance shall be less than one-third; in the event of retirement before the completion of ten years' service the officer's own contributions with interest at 3 per cent. shall be repaid. Officials are to contribute from 3 to 5 per cent. of their salaries or wages, the amount varying with the age at which they entered the service of the Council, those who enter the service under twenty-five years of age contributing 3 per cent.

If it is the duty of the nation and of the municipality to provide for their employees in this way the duty must have a scope wide enough to include teachers. The present House of Commons in March of last year (1906) agreed that a measure is urgently needed in order that, out of funds provided by taxation, provision can be made for the payment of a pension to all the aged subjects of His Majesty in the United Kingdom. A Departmental Committee of experts, presided over by Sir Edward Hamilton, estimated that in 1901 the population of the United Kingdom over sixty-five years of age was a little over two millions; at five shillings a week the cost would be twenty-six million pounds. Surely a more reasonable plan would be to extend the circle of pensioners to those who, though not directly employed by the Government, are working under its auspices. The Board of Education is a Government Department to which the employers of a large number of teachers are responsible. Surely teachers who have grown old while working in schools under the control of the Board have a better claim to pensions than men who have grown old earning profits for themselves or for private firms, perhaps in a capacity which has had little or no effect on the well-being of the nation.

Yet the new draft scheme for Maidstone Grammar School, issued in 1905, was the first which made provision for allowing the governing body to contribute to the life insurance premiums of the staff, and even then limited the amount to a part not exceeding one-half of such yearly payments.

The Elementary School Teachers Superannuation Act has been in force since 1898. Under it men teachers contribute three pounds a year and women teachers two pounds four shillings. Provision is made for increasing the amount of the

contributions as the average salary of certificated teachers increases. A teacher benefits in three ways. On reaching the age of sixty-five he is entitled to an annuity for life, the amount of which depends on the number of contributions and the teacher's age at the date of payment. If a master contributed regularly from the age of twenty he would be entitled to an annuity of nearly £35; a mistress would be entitled to one of about £20. No return of any kind is made for a teacher's contributions unless he lives to the age of sixty-five. The only return then made is the annuity. In no circumstances can he or his representatives obtain any part of them in a lump sum.

The second benefit is the Superannuation Allowance. This does not become payable until the age of sixty-five is reached, and is in addition to any annuity to which the teacher is entitled. His years of recorded service must be at least one-half of the number of years that have elapsed since he was certificated, but the years of service need not be continuous, nor is it necessary for a teacher to remain in service to the retiring age. The amount of the allowance for teachers certificated after the passing of the Act is ten shillings for each completed year of recorded service. For teachers certificated before the passing of the Act the amount is augmented by threepence in the case of a man, and by twopence in the case of a woman, for each complete year of recorded service before the commencement of the Act. The Disablement Allowance is intended to meet the case of a teacher who before reaching the age of sixty-five has become permanently incapable of being an efficient teacher. To be eligible for this allowance he must submit to medical examination, have served not less than ten years, and not less than half the years that have elapsed since he became certificated, and must fulfil other conditions, one of which is that he is in pecuniary need of the allowance. These allowances are reconsidered every three years.

Thus by contributing three pounds a year for forty-five years an elementary-school teacher may, if a man, secure at the age of sixty-five, if he ever reaches it, about a pound a week for the rest of his days; if a woman, less. The secondary-school teacher is worse off; though both elementary- and secondary-school teachers are working to bring about the same result—the well-being of the youth of the nation; though the difference between them should be only one of degree, yet the secondary-school teachers in England are dependent for retiring allowances on their own savings—savings which, from their salaries, must be infinitesimally small—and on the generosity of private corporations and of governing bodies, whom the Government now permits to contribute to life insurance premiums a part not exceeding one-half of such yearly payments.

The principles governing pension schemes for secondary-school teachers and the provision already made for them will be considered in a future article.

DRAWING SUBJECTS IN THE CAMBRIDGE LOCAL EXAMINATIONS.

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A SIGN of the times, which would appear to indicate that drawing is beginning to receive a meed of recognition more in proportion to its deserts than has been the case hitherto, is to be found in the regulations for the Cambridge Local examinations in 1908, wherein are contained particulars of certain changes in the requirements for drawing.

The new syllabus differs from the old one in several important details, the general effect of which will be to broaden the scope of the examination and to offer a boy a more varied choice of subject in which to present himself. The direct result of these alterations is distinctly advantageous to the candidate, and if, as an indirect result, they may lead to a more generous provision of opportunities for drawing in the arrangement of the school time-table, and to the organisation of a more definite and coherent scheme of work to replace the scrappy methods which at present prevail in many secondary schools, they will effect a consummation devoutly to be desired.

The points of difference between the syllabus issued in 1907 and its predecessors may be summarised as follows :

Preliminary.

FREEHAND; the drawing to be *enlarged or reduced*, instead of merely reduced as formerly.
MODEL; is introduced as a subject of examination.
GEOMETRICAL; no change.

Candidates may not be examined in more than two subjects. In order to "pass," they must satisfy in any one subject, and, to obtain "distinction," must pass in any two out of the three.

Junior.

FREEHAND; no change.
MODEL; includes *Hexagonal Prism and Triangular Prism* in addition to objects in previous years' lists.

GEOMETRICAL; no change.

DESIGN; instead of being left in outline, the background or the ornament may be coloured.

Senior.

MODEL; the whole of the group is now to be shaded, instead of only one object as formerly.
(Other subjects no change.)

It may be noted that in the junior and senior divisions the examination time-table is so arranged that candidates who offer themselves in two drawing subjects (which is the minimum required for a "pass") must include either model or freehand, whilst those who offer three subjects must include both model and freehand.

Of these alterations in the syllabuses, perhaps the most gratifying feature is the increased im-

portance which is given to model drawing; in the preliminary stage by its introduction as a subject of examination, in the junior examination by the addition to the list of objects, and in the senior by the demand that the entire group be shaded.

The extreme importance of object drawing cannot be overestimated, either as a foundation for the further study of art or merely as a means of hand and eye training; as, moreover, it is a subject which can be taught on certain well-defined lines, and can be examined and marked according to universally accepted laws and canons of art, it can be adopted with more fairness to both teacher and student as a subject for school examination than, say, "design," where so much depends upon the natural aptitude of the boy (much more so than in model or freehand), and upon the taste and individual caprice of the examiner. It is perhaps to be regretted that design is included in the list of subjects, as the obvious preliminaries to the attainment of any skill in designing are the ability to draw with freedom and accuracy, and the acquisition of a fund of knowledge of natural and ornamental forms, to say nothing of some acquaintance with the history of ornament, the possibilities and limitations of materials, and so forth. The fulfilment of these preliminary conditions demanding considerably more opportunities for study and practice than falls to the lot of the average secondary-school boy, it is obvious that any attempt at original design on his part must be seriously handicapped by this want of knowledge and power, and the result, of necessity, be immature and therefore unsatisfactory.

In practice one fancies that the subject frequently resolves itself into a question of "space-filling," and the memorising of certain conventional forms and arrangements of leaves and flowers, to be adapted as occasion may require, thus converting the test rather into one of "free-hand-from-memory," with the addition of a slight wash of colour which may give scope for some indication of skill and taste. The substitution of "architecture" for "design," requiring an acquaintance with the main characteristics of the historic styles, would provide a far more satisfactory basis of examination, involving a more definite and practical course of instruction, besides equipping a boy with a store of information likely to be of infinite value to him in later life.

There is, however, a sufficient choice of subject to allow plenty of latitude in the selection of the requisite three, without including design, unless the choice be unduly limited by the overlapping of other subjects; for example, a boy in the junior section who is taking literature, and who wishes to offer himself in three drawing subjects, will have no choice but to take model, freehand, and design. In view of this occasional overlapping, a careful study of the examination time-table is advisable before the list of subjects is finally decided.

To pass now to the consideration of the syllabuses in detail, we find, as regards the model

drawing, that in all three sections, geometrical models are required, such as those used in the Board of Education examinations; with the addition in the senior and junior sections of one or more common objects. These combinations should present little difficulty to boys who, by the time they are ready to take these examinations, will doubtless have been drawing from models and objects for some considerable time. There are one or two points, however, on which it is necessary to lay great stress, namely, the necessity for making the drawing fill the paper, and the importance of observing the relative proportion of each object in the group to the remaining objects and to the group itself. Every teacher must be familiar with the overpowering and almost universal tendency to make a small and "pretty" drawing, and one can hardly take up an examiner's report without coming across some comment on the frequency of this occurrence. This tendency can be corrected to a great extent by the practice of first fixing the extreme width of the group (which is generally determined, in the orthodox examination group, by the outer corners of the drawing-board) close to the edges of the paper.

The fault of disproportion is largely due to the habit of drawing the group "piece-meal," concentrating the attention solely on the object under immediate consideration and ignoring entirely its relation to the group as a whole. This can only be checked by insisting on a frequent comparison of the drawing with the group, with the paper held vertically at arm's length, and by a more careful regard being paid to the shape and size of the *spaces* that occur between the various objects in the group, and to the amount of overlapping of one object by another; in short, by the consideration of a group as a collection of *masses* and *planes* rather than as a combination of *lines*.

Of the multitude of text-books and "guides" in connection with this branch of drawing, one which has recently come to my notice commends itself on account of the vigour and novelty with which the author presents the familiar rules, and the ingenious way in which he produces corroborative evidence in the shape of photographs, which emphasise and confirm these principles in a most convincing manner. To those who feel the need of such guidance this book ("Object Drawing," by E. A. Branch : Ralph, Holland and Co., 2s. 6d.) may be strongly recommended.

The syllabus for FREEHAND is again on the familiar lines of the Board of Education examinations, the candidate being required to make a reduced or enlarged copy of a piece of ornament, generally in low relief. Here again one should be careful to guard against the production of neat and highly finished drawings with a total disregard for proportion and spacing; the washing-in of a flat tint of colour over either the background or the ornament will be found a ready and convincing method of correcting these errors. There are many excellent sets of examples to be obtained for practice in this subject; the "Photo-Relievo"

series issued by Messrs. Bacon and Co. consists of well-selected examples of good ornament, which are admirably lighted and reproduced; Messrs. Ralph, Holland and Co. also publish a book on the subject by Mr. E. A. Branch, containing a useful collection of copies, together with suggestive remarks on methods and treatment.

GEOMETRICAL DRAWING involves an acquaintance with the elementary principles of plane geometry, together with a few exercises in drawing plans and elevations of the simpler geometrical solids. As the examination is largely a test of neatness of work and accuracy of construction, it is advisable to insist on a high standard in both respects from the beginning. In this connection a trustworthy compass and an accurate ruler are essentially necessary; it behoves the teacher, therefore, to keep a sharp eye on the abortions in the shape of "patent" compasses which are often adopted for the sake of novelty or cheapness, but which are frequently a delusion and a snare, and prove a serious handicap to the student.

Any of the well-known text-books on geometry, such as Spanton's "Geometrical Drawing and Design" (Macmillan), Carroll's "Practical Geometry" (Burns and Oates), Gill's "Imperial Geometry," or Morris's "Geometrical Drawing" (Longmans), amply cover the ground required for this examination.

The PERSPECTIVE examination deals principally with the representation of solids resting on the ground plane, or involving the occasional use of a vertical plane, perpendicular to, or inclined to the picture plane. Among many other standard works, the subject is dealt with in a very simple and practical manner in "Linear Perspective," Parts I. and II., by John Carroll (Bacon, 2s. 6d. each part).

With regard to the MEMORY DRAWING for seniors (why not, by the way, for juniors also?—it is a valuable and interesting branch of study, which cannot be commenced too soon), no list is given, but presumably the object selected will be of a well-known, everyday variety.

A usual course of procedure adopted in the study of this subject is for the article selected to be exhibited for a few minutes, then to be removed and drawn from recollection. A better plan, in my opinion, is the one recommended by Dr. Kirschensteiner, of Munich, whereby the object is announced, and drawn *from memory first*; the drawing is then corroborated or corrected by reference to the object, which is then removed and the drawing done again from memory. Which-ever method be adopted, constant practice and rapid execution are the great essentials.

Should it be found desirable to take DESIGN as a class subject, "Nature Drawing and Design," by F. Steel (Bacon), will be found of great assistance. It contains an infinite variety of floral forms adapted to fill almost every conceivable space, together with valuable suggestions for the construction and treatment of designs, such as are required for the purposes of this examination.

The report of the examiners in drawing for the

Cambridge Local examinations of December, 1906, draws attention very forcibly to the prevalence of the faults of disproportion in both model and freehand drawing, to which I have already referred. The following extracts from the report will show how general are the grounds for complaint: "There were, however, many drawings, otherwise satisfactory, which showed that the candidates had given but little thought to the general proportions of the figure." "Many drawings, in themselves well balanced and drawn, were quite unlike the copy, the proportions of the whole having been entirely changed" (Preliminary, Freehand).

"The prevailing faults were due to careless preliminary sketching, and inaccuracy in representing the proportion and balance of the copy" (Junior, Freehand).

"It was evident, however, that many candidates had received little or no training in the drawing of 'groups' of models. . . . They consequently showed small capacity for giving an intelligent representation of the position of the models in relation to each other" (Junior, Model).

"The inferior drawings displayed, as a rule, over-elaborated details and bad proportion. . . ." (Senior, Freehand).

"Often, however, the proportions of the objects were incorrectly represented, and the objects themselves were drawn in impossible positions in relation to one another" (Senior, Model).

A striking fact in connection with the report is the extremely small proportion of candidates (about 50 per cent. on the average) who "satisfy the examiners." That this is not due to an exceptionally high standard of merit being demanded by the examiners is evidenced by the examples reproduced of drawings which have reached the "Pass" standard; these tend to show that the examiners have, if anything, erred on the side of leniency. Making all allowance for the fact that a boy who is clever at drawing may frequently be precluded from offering himself in this subject by the overlapping of other subjects, whilst a boy who is not clever may often be compelled to offer it in order to make up his number of subjects, one is bound to admit that, if the results of these examinations may be taken as a criterion, there is room for much improvement and reform in the teaching of drawing in many secondary schools.

One is pleased to note, in passing, the emphasis which is placed on the value of "memory drawing." "The importance of this study cannot be overrated, and, where time for drawing is limited, it might supplant other less useful subjects."

The report on the design examination, together with the examples illustrated in the junior division, would appear to bear out my contention as to the unsuitability of this subject for class teaching in schools. Apart entirely from its bearing on examination results, this report may be studied with advantage by all teachers of drawing; if they learn nothing new from the various criticisms and suggestions, they will, at any rate, find ample food for reflection.

MODERN VIEWS CONCERNING ELECTROLYSIS.

By G. H. WYATT, B.Sc., A.R.C.Sc.

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IT will probably be easier to understand the modern views concerning electrolysis if we first inquire why the older notions have been superseded. Consider the apparently simple case of electrolysis of a copper sulphate solution between electrodes of metallic copper. A very small electro-motive force is all that is necessary. Copper is deposited on the cathode and an equal weight of the metal is dissolved from the anode, the strength of the solution therefore remaining constant. This equality is difficult to demonstrate except by the constancy of the strength of the solution, for the surface of the anode is oxidised and the black oxide falls off to some extent.

The process may be explained completely on Grotthus's hypothesis that the molecules of copper sulphate originally lying at random take up an orderly arrangement on the application of an E.M.F. In such an arrangement the molecules form a chain with their positive portions towards the negative electrode. The copper atom nearest the negative electrode is deposited thereon; the SO_4 group nearest the anode unites with a new copper atom obtained from the electrode, and the intervening molecules change partners along the chain. Except that in each molecule there is this change of partners between neighbours, nothing else happens, and the electrolyte consequently exhibits no visible action. If the electrolyte in every case showed no change, then Grotthus's hypothesis would always be sufficient.

Grotthus illustrates his hypothesis by considering the case of water, and concludes that if a circular current could be maintained in water without using electrodes, then all the water particles, which should lie along the path of the current, would instantaneously decompose and the parts recombine and, consequently, though conveying electricity, the liquid would always remain water.

A modification of this view was proposed by Clausius; he suggested that some of the salt molecules in the solution were dissociated into positive and negative constituents, which under the influence of the applied E.M.F. moved towards the cathode and anode respectively. These ions might sometimes move as far as the electrodes, or, on the other hand, collide with fresh molecules, and, causing them to decompose, produce more free ions. The effect of the electric force would thus be a general motion of free ions towards the electrodes in opposite directions. The proportion of dissociated molecules was assumed to be small.

Now, if the electrolysis of copper sulphate be carried out in certain ways, it is possible to detect a change in the solution itself. The simplest method is to use a vertical glass tube, a foot or

so in length, and to place the electrodes horizontally and two or three inches apart. The cathode should be uppermost, and to permit of free diffusion, it should be perforated with a series of holes. When two or three cells are used it is found, after a while, that the upper half of the liquid becomes lighter and the lower half becomes darker in colour. This result shows that the copper is taken from the solution round the cathode, while that dissolved from the anode cannot diffuse upwards fast enough to replace it. No such change in colour is noticed if the tube be placed horizontally.

In order to explain the process of electrolysis it is necessary, therefore, not only to measure the quantities of ions set free at the electrodes, but to attend carefully to the condition of the liquid itself. The earlier explanations of the change of strength of the electrolyte near the electrodes were arrived at by asserting that the cation was derived solely from the liquid around the cathode. Hittorf showed that this assertion was unfounded, and by his classical experiments first demonstrated the actual movement through the liquid of both ions, in opposite directions and with different velocities.

As an example of Hittorf's work, one experiment in which copper sulphate was electrolysed may be mentioned. The electrolytic cell made of glass was divided into three parts by porous diaphragms. One part contained the anode, another the cathode, and the third simply the liquid. Each portion of the cell was provided with an opening which could be closed by a glass stopper. The current employed was measured by the quantity of silver deposited in a voltameter. Each cell was filled to the same height with solution of known strength, and at the close of the experiment the strength of that in the division of the cell containing the cathode was again determined. From the quantity of silver deposited in the voltameter the copper deposited on the cathode was estimated to be 0.5918 gram. The solution in the cathode division was found to have lost 0.4142 gram of copper. The difference between these two quantities, namely, 0.1776 gram, represents the weight of copper which had travelled into the cathode cell during the passage of the current. That is, 30 per cent. of the reduced copper had "migrated" towards the cathode. This result is known as the migration ratio of copper in copper sulphate solution, and is stated as 0.3.

Further experiments by Hittorf decided that this migration ratio for copper increased with dilution of the electrolyte to a maximum which remained constant for further dilution. It was also shown that the ratio was independent of the current strength used. A similar series of experiments with silver nitrate led to corresponding results, the limiting value of the migration ratio for silver being 47.5 per cent.

The current through the electrolyte is conveyed partly by the cations, partly by the anions, and since, according to Faraday's laws, we may define

current as measured by the number of equivalents of either cation or anion set free, we may say that out of one unit of current passing through copper sulphate solution, 0·3 of the current is conveyed by the copper cations and 0·7 by the anions in the solution.

This may be further explained by considering the changes in the three divisions of Hittorf's electrolytic cell, during the passage of one unit of current—that which decomposes one equivalent of the copper sulphate. In the cathode division, one equivalent of copper is deposited, and 0·3 equivalent arrives from the middle division. In the anode division, one equivalent of copper passes into solution, and 0·3 equivalent migrates into the middle division. Substituting 0·7 for the migration ratio of the anion SO_4^- in these statements, and remembering the opposite direction of the movement of the anion, the results are seen to be :

- (1) No change in the middle division.
- (2) A loss of 0·7 equivalent of CuSO_4 in the cathode division.
- (3) A gain of 0·7 equivalent of CuSO_4 in the anode division.

Hittorf's numbers give the relative velocities of the ions. Now, the actual velocities can be obtained if their sum and ratios are known. The sum is obtained by measuring the rate at which electricity is conveyed by the electrolyte; that is, by measuring the specific conductivity of the liquids. Then we have the equations:

Sum of velocities \times charge on 1 ion \times number of ions = current conveyed.

Also current = E.M.F. applied / resistance of electrolyte.

The specific conductivity divided by the number of gram equivalents of the electrolyte per c.c. is called the equivalent conductivity, and in the case of each salt this quantity was found to increase with further dilution until a maximum was reached, beyond which the equivalent conductivity was constant. The migration ratios give the proportion in which the current is divided by the anions and cations. If the equivalent conductivity be then divided in the same ratio, the ionic conductivities are obtained; and, since the charge carried by one equivalent is 96,600 coulombs, the conductivity of any particular ion divided by this number gives its velocity per second under a unit difference of potential per unit length.

It has also been found that the conductivities of salts may be approximately ascertained by adding together those of their ions found by means of experiments with other compounds containing these same ions. The meaning of the value of the ionic velocity is that it expresses either the average velocity of any single ion throughout a long period, during which it may sometimes even be at rest, or the average velocity of one ion deduced from that of all the ions concerned free or combined.

The modern theory of electrolysis is based on the idea of a more or less complete separation of an electrolytic solution into its constituent ions before any E.M.F. is applied. A salt being dis-

solved in a liquid is by the act of solution dissociated more or less completely into its constituent ions. In fact, the electrolytic conductivity of a liquid is looked upon as evidence of dissociation having already taken place. Experimental results support the hypothesis of dissociation, at least for very dilute solutions. The steps which lead to this hypothesis of Arrhenius may here be briefly summarised. Let a salt solution be confined in a vessel provided with a pressure gauge, and closed with a membrane, through which the salt cannot pass, but which allows water to do so. Now let the vessel be placed in water. The solution is observed to draw water to itself, and the gauge indicates a resulting rise of pressure. This increase of pressure in the containing vessel is known as the osmotic pressure of the solution. It may amount to several atmospheres, and has a value which varies with the salt and its concentration. The difficulty of the observation arises from the necessity of forming a semi-permeable membrane suitable to the solution to be examined. In experiments with cane sugar, for example, the membrane is made of cupric-ferrocyanide, and the pressure observed in the case of a one per cent. solution varied, according to the temperature, from 0·6 to 0·7 atmosphere.

Indirect methods are available for measuring osmotic pressure, and these depend upon the principle that the pressure is a measure of the work done in separating the salt from the solvent. Examples of the methods are observations of vapour pressure, solubilities of two substances at once in the same solvent, and lowering of the freezing-point. Osmotic pressure depends upon concentration in an analogous manner to the relation of pressure and volume in a gas (Boyle's Law). The increase of osmotic pressure with rise of temperature in a solution follows the same law as that of rise of pressure in a gas under like conditions (Gay-Lussac's Law). The resemblance between osmotic pressure in dilute solutions and gaseous pressure, explained on the kinetic theory as due to separate particles, is so close as to suggest that this pressure in solutions is similarly due to the particles of the dissolved substance filling the solvent. This suggestion has been confirmed by calculations which foretell the osmotic pressure of sugar solutions on the hypothesis that it is the particles of sugar which, occupying the space filled by the solvent, produce the pressure. These calculations are based on the fact that a certain number of grams of hydrogen, e.g., filling a certain volume produce a known pressure. Success has also attended calculations made to ascertain the lowering of the freezing-point on the same hypothesis.

There seems little reason to doubt, therefore, that the constitution of solutions closely resembles that of gases. But in the case of most acids, bases, and salts dissolved in water, the observed osmotic pressure is greater than that calculated from their molecular weights according to the gas laws. It is concluded that with these substances complete dissociation occurs on solution, the mole-

cules breaking up into the parts which have been termed ions. Thus, in the case of NaCl, if the osmotic pressure be calculated on the assumption that it is produced by molecules of NaCl behaving in the solution as gaseous particles occupying the same space, the value found is smaller than that found by experiment. The actual value corresponds more nearly to that calculated on the hypothesis that each molecule dissociates into the separate ions of Na and Cl. This dissociation is more likely to become complete and remain so when, by reason of the large space occupied by the molecules, the ions have a much smaller chance of coming into contact with one another. Thus dissociation is considered to be complete at infinite dilution.

The dissociation, γ , is the proportion of molecules which are broken up into smaller ones or ions. That is, out of 100 molecules, 100γ are separated into two or more (n) ions. In the case of NaCl, each molecule may yield one ion of Na and one of Cl. Here $n=2$. If γ molecules decompose, the total number, starting with 100, is $100\gamma n$ (the new molecules) + $100 - 100\gamma$ (the undissociated molecules). Thus, the number of molecules present increases from 100 to $100\gamma n + 100 - 100\gamma$ or $100\{1 + (n-1)\gamma\}$.

It is the proportional increase $1 + (n-1)\gamma/1$ which is the important quantity, and gives the ratio of the observed osmotic pressure to that calculated on the assumption that no ionisation takes place, the molecules behaving as ordinary gaseous particles.

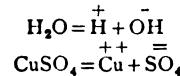
Experiment shows that the osmotic pressure and conductivity of solutions both increase with dilution to limiting values, and the values for the degree of ionisation calculated from each increase agree with one another. If Λ_∞ is the conductivity at infinite dilution, i.e., the maximum conductivity, and Λ that observed in any particular concentration, the degree of ionisation $\gamma = \Lambda/\Lambda_\infty$.

Similarly, if P_0 is the osmotic pressure calculated according to the gas laws, and P that observed, the degree of ionisation $\gamma = \frac{P - P_0}{(n-1)P_0}$.

In the case of a badly conducting liquid, the degree of ionisation is very small. In 1 gram of water, for example, it has been estimated that only 10^{-10} gram is dissociated. This gives about 10^{14} charged atoms of hydrogen, and an equal number of hydroxyl ions.

Ionisation in gases may be said to have been completely established experimentally, and its production by several different methods demonstrated. Negatively charged particles having a mass one thousand times smaller than that of a hydrogen atom are referred to as electrons. To charge an atom negatively means to increase its mass by this quantity, and to charge an atom positively means a corresponding decrease in mass. This change in mass is looked upon as explaining, at least partially, the possibility of sodium chloride dissociating in solution, not into ordinary atoms, but into those of slightly different masses with different properties known as sodions

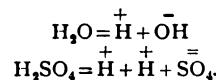
and chlorions. In an electrolytic cell the cations travel to the cathode and yield their charges to the electrode; the anions in the same way discharge on the anode. As an illustration we may consider the electrolysis of copper sulphate between copper plates. The ions present are derived both from the water and from the salt, thus :



in which the charges are represented in kind and amount by the signs over the symbols.

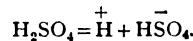
At the anode, copper ions are formed, hydroxyl ions and sulphions are discharged. The first of these processes means copper dissolving from the electrode, the second implies oxidation of the copper plate (the blackening noticed in the experiment) and the last a production of fresh sulphate of copper. At the cathode, copper ions are discharged mostly from Cu to Cu, but partially to Cu. This means some production of cuprous sulphate. Further, hydrogen is discharged if the current strength is large, and the strength of the solution not kept up around the cathode by stirring.

The actual processes occurring at an electrode depend thus to some extent upon the circumstances of the experiment, those taking place which can do so most easily. An illustration of this may be given by considering the electrolysis of sulphuric acid between platinum plates. In very dilute acid the ions are :

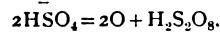


Here the acid is completely dissociated, and oxygen and hydrogen appear at the electrodes.

In the case of stronger acid the dissociation is less complete :



The HSO_4 ions, having given up their charges and become neutral, combine together to form persulphuric acid.



In the case of 50 to 60 per cent. acid, electrolysis produces very little oxygen, but much persulphuric acid. But even in dilute solutions some of the new acid is formed, and this accounts, at least partly, for the volume of oxygen set free being slightly less than one-half that of the hydrogen.

First Stage Human Physiology. By Dr. G. Norman Meachen. x+240 pp. (Clive.) 2s.—Designed especially to meet the requirements of candidates for the examination in physiology of the Board of Education, Dr. Meachen's little book is so clearly written that it ought to appeal to more general readers also. The instructions for simple practical work, and the easily copied diagrams, will prove of considerable value to students.

THE TEACHING OF ENGLISH IN PUBLIC SCHOOLS.¹

By J. H. FOWLER, M.A.
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BREAKING away early from classical traditions and set forms, fostered by no National Academy of Letters, directed by no systematic or authoritative criticism, English literature—in depth and range probably the greatest literature in the world—has grown up in the same absent-minded way in which the British Empire is said to have grown. For many generations even the greatest Englishmen persistently undervalued their own literature. Though Addison taught his countrymen to admire Milton, he was not fully aware of Milton's greatness; though Johnson wrote of Shakespeare with splendid acumen, he was far from understanding Shakespeare's unique position as it is now realised. Even now, when everyone is prepared to admit theoretically the importance of English literature, it is only fighting its way slowly to an assured place in the curriculum of English schools. Thirty-seven years ago Sir John Seeley—the same whose historical and political writings did more than those of any other man to awaken in Englishmen a sense of the significance of the expansion of England overseas—published an eloquent plea for the study of the English language and literature in English schools. "Everywhere but in England, I imagine, the native language makes a prominent part of the educational course." When these words were written in 1870, the education in English secondary schools, both of the higher and the lower grades, both public and private, was still preponderantly classical. There have been great changes since then, but they have hardly been in the direction desired by Prof. Seeley. In all the public schools, with the exception of two or three of the most conservative, the conflict of studies has resulted in the institution of a "modern side" parallel to the "classical side"; in many there is an "army side" which is separate from the classical and modern sides; and in some there is opportunity for a good many varieties of specialisation at the top of the school. On the classical sides practice varies a good deal as to the teaching of English. Many classical schoolmasters are hostile to English teaching, on the grounds that—

(1) The elements of grammar can best be taught through an inflected ancient language.

(2) Every lesson in classical translation and composition is, or should be, a lesson in English.

(3) The study of the classical forms of literature should come before the study of the more complex and irregular modern forms.

(4) Classical training, if it is to be thorough, requires all the time that is available for literary subjects.

The practice at Clifton College probably represents rather more than the average time allowed

to English on classical sides. One hour a week is here given to English literature in all the classical forms, and one hour to history, English history being taken in one term of the year, and ancient history in the other two. In addition, lessons are given in the lowest forms in the uses of the parts of speech. On the modern side four hours a week are allowed for English subjects throughout the school, five hours in the lowest forms where English grammar is taught. In the higher forms on the modern side a certain number of boys take extra English as an alternative to science. These boys give eight hours a week in school to English subjects. Throughout the school, on both classical and modern sides, English essays are set fortnightly to be written out of school. In the sixth form great importance has been attached to the essays for many years. The subjects for the whole term are announced at the beginning of each term, and all the essays are looked over with the boys individually.

In schools below the rank of the first-grade public schools—in the secondary schools, in fact, which now are subject to the Board of Education—the changes of the last thirty years have entirely dethroned the "grand old fortifying curriculum" from its long-established supremacy, and have substituted an education which has mainly in view the practical needs of life. Natural science, mathematics, commercial geography, modern languages taught more and more from the point of view of practical utility, and various kinds of technical instruction, have all claimed an increased share of attention. That English literature has been taught at all has been chiefly due to the requirements of certain public examinations which have largely determined the curricula of schools of this type—the Oxford and Cambridge Local Examinations, the Oxford and Cambridge Schools Examination Board, the examination of the College of Preceptors, and the Matriculation Examination of London University. Thus the characteristic defect of the English examination system—the study of elaborately annotated books—has pervaded the English literature teaching of these schools. But lately, it is pleasant to add, two important changes have been made which should be fruitful of good results. First, the London University has devised a new type of English examination which cannot well be crammed out of text-books, and which aims at the enlargement of the pupil's vocabulary and the strengthening of his powers of expression and power of intelligent reading. Secondly, the Board of Education has made a most praiseworthy attempt to graduate the English reading of pupils between the ages of twelve and sixteen, and to improve the practice of English composition.

The present state of things with regard to the teaching of English in English secondary schools may therefore be summarised as follows :

(1) In the great public schools a diminished number of boys are still receiving an education which is mainly literary. In some of these schools very little English literature is read, and very

¹ Contributed to the Federal Conference on Education, and reprinted, with permission, from *The Federal Magazine*, May 15th, 1907.

little English composition is practised. It may readily be admitted that those boys who carry on their classical studies to the university do not greatly lose, both because their training in the ancient classics is an admirable preparation for the later reading of modern European literature, and because they indirectly learn the use of their own language in the practice of translation and composition. On the other hand, those boys who cease to pursue their classical studies at the age of sixteen or seventeen have probably gained little beyond the mental discipline from their classics; they have missed that foundation of a literary and humane education which could have been laid in wisely directed English studies.

(2) On the modern sides of the great public schools it is generally recognised that the only chance of preventing the materialisation of studies, and of continuing to the modern public-school boy any part of the humanism which has been the best feature of English public-school training on the intellectual side, lies in the study of English literature. Fortunately the modern sides of these schools have had among their masters many men who have been conspicuous for their knowledge and love of English literature. It would be impossible to over-praise the excellence, and especially the stimulating qualities, of the teaching in particular cases. But probably there are few modern sides on which the study of this subject has been organised on any general plan, and in any case the schools have developed their systems independently with little knowledge of what was being done elsewhere. It will be one of the tasks of the lately-formed English Association to bring them into communication with each other, and to enable each school to gain from the experience of the rest.

(3) In the other secondary schools the prevailing type of education is less and less a literary type. No necessity, I conceive, is more vital for the future of English education than the necessity of securing that every boy and every girl who passes through these schools shall come, through wisely determined English studies, under that humane influence which can best be given through literature. The present position of English studies in these schools is, as the last Board of Education report bears emphatic testimony, far from satisfactory. At the same time, the most hopeful feature of the situation is the anxiety of the Board to bring about an improvement.

The development of English teaching in our English schools, as I have sketched it, is still at so rudimentary a stage that it may perhaps be felt that Colonial schools have little to learn from it. But the sketch may be of use if it explains historically why comparatively little has yet been done in the right direction. There is no real reason for discouragement. A new study starts without the advantage of traditional methods of teaching. It was natural that at first there should be experiments in wrong directions, and especially that the new study should be unduly influenced by methods more appropriate to the old classical

studies. If we can agree as to the aims to be kept in view in the development of English teaching, and are agreed about its importance—and I anticipate a large measure of agreement on both points—I look forward to an immense advance within the next few years. I will venture to suggest in conclusion some of the ways in which we may look for improvement.

(1) We shall take more pains to graduate carefully the English literature read in school, and to see that nothing is read which is wholly beyond the pupil's comprehension, and at the same time that nothing is read which is not really literature. The scheme of the Board of Education already mentioned is a valuable step in the right direction.

(2) As our chief aim is to be the foundation of a love of reading and a taste for the best literature in after-life, rather than the preparation for later specialising in English literature as a university subject, we shall aim at more rapid and continuous reading than has been commonly practised in this study hitherto. The minute study of a single poem or play may profitably be undertaken from time to time by the higher forms of a school; but with the higher forms generally, and with lower forms almost always, we should aim at reading English literature at a rate sufficiently rapid to give the form a *whole impression* of the book they are reading. The practice of devoting a whole year to a single play of Shakespeare, common in many English schools, though not in the public schools, seems to me radically unsound. The high authority of Prof. Raleigh, in his new book on Shakespeare, may be quoted in favour of the impression that is got by "alert and rapid" reading, and by that only.

(3) We shall recognise that the best fruits of this study cannot be tested by examination papers—certainly not by the prevailing type of examination paper, with its literary questions which can be answered by rote out of an introduction, and its grammatical, philological, historical, or "general information" questions which can be answered out of the notes. If we are to test our teaching in this subject at all—and it is only right that we should wish to do so—we shall rely rather on the test that can be furnished by English composition, taught as the art of *self-expression*. For

(4) much may be done for the teaching of English composition in this direction. Here, too, we shall take pains to graduate subjects according to the age and experience and capacity of our pupils. We shall neither lose sight of the simple but invaluable practical ends that may be served by composition—the learning to write a business letter lucidly, concisely, courteously; the learning to make an abstract of an argument, to sum up a case, to describe something seen—nor yet of more ambitious aims, such as the acquisition of a large and flexible English vocabulary, the acquisition of the rudiments of a style and a literary sense.

(5) We shall do increasingly more to correlate the study of composition with the study of literature and the study of history, but also with every

subject that is taught in our schools. It is not too much to say that every lesson ought to be a lesson in English. If only we schoolmasters were properly proud of our heritage—if only we realised how splendid a boast it is to "speak the tongue that Shakespeare spake"—this English question would speedily settle itself in our schools. For every master would be careful of the example he set to his pupils and intolerant, in himself as well as in them, of the slovenly and slipshod speech that is a wanton degradation of our noble mother-tongue; and few things, I think, would lie nearer to his heart than the desire that in our national literature the coming generation might find a link to bind them to all that was most precious in the past, an inspiration to the loftiest patriotism, a constant source of purifying and elevating thoughts and affections.

THE PRELIMINARY EDUCATION OF ELEMENTARY SCHOOL TEACHERS.¹

III. FROM THE POINT OF VIEW OF THE PUPIL TEACHER CENTRE.

By H. W. DUFFIN,

Headmaster, Pupil Teacher Centre, Norwich.

IN the two able articles that appeared last month upon this subject, the question was considered from the point of view of the secondary school and that of the training college, and in neither case did the writer give the new regulations his blessing. Mr. Elford fears that the proposals "will in no way meet the difficulties, though they may supply to a very limited extent an additional source of teachers." Coming from the pen of the headmaster of a large secondary school, who has evidently had actual experience of the difficulties in question, these words would not appear to indicate that the millennium is to be expected in the immediate future. Indeed, Mr. Elford's article very clearly shows that even from the point of view of the schools in the interests of which the new regulations play so important a part there are grave doubts as to the issue. He fears that "but few will take advantage of the new facilities," mainly because of the inadequate remuneration offered during the term of bursarship.

Mr. Jarvis, who considers the educational equipment of the new bursar in its relationship to the requirements of the training colleges, and quite clearly has an intimate acquaintance with the established machinery for the supply of elementary-school teachers, comes to the conclusion, after a very impartial examination into the prospective working of the new scheme, that our teachers may become "slightly less efficient." From this conclusion he certainly derives some hope that the diminished efficiency of the teachers may be but a blessing in disguise to education, and all for the good of the human boy; a paradox upon which the opinion of headmasters of elementary schools, who after all should perhaps be heard upon this matter, would be of some interest.

¹ Two articles on this subject appeared in THE SCHOOL WORLD June, 1907.

Now from both these points of view it has been assumed that, while the new regulations are not likely to be immediately successful, this is only because they do not go far enough, and because they still leave difficulties in the way of the working of the secondary schools. The fundamental questions of whether the pupil-teacher system is right or wrong, or whether under the improved conditions it has been given a fair trial, are ignored, and it is tacitly taken for granted that the policy of the Board of Education of destroying the pupil teacher is a good one. The other side of the argument, however, has an undoubted right to be heard.

The main characteristic of the system that the Board of Education seems bent upon abolishing is the idea that a young person who intends to become an elementary-school teacher should, from the age of sixteen, begin to get an insight into the realities of his future profession. For this purpose the half-time system has been devised, under which the pupil teacher has spent half of his two years' period of engagement in attendance at an elementary school, where, under supervision, he has watched the methods of teaching, and taken some tentative part therein for the purpose of training. The rest of the time has been spent, in many large towns, in pupil-teacher centres that have been equipped, staffed, and organised for the special purpose, and where he has pursued his studies upon lines laid down by the Board of Education. Thus his academic education has been carried on side by side with his first steps in professional training.

Four years ago serious objections might have been raised to this dual scheme. For then many of the pupil teachers came straight from an elementary school, and it was hardly possible for them to attain a good standard of general education during their apprenticeship. A meagre curriculum, and over-pressure at that, were the common result, and one that the Board of Education very properly objected to. But two years ago the Board issued regulations which have resulted in a very different state of things. Except in rural districts, where the conditions must, of course, always present difficulties, intending pupil teachers attend a secondary school until the age of sixteen, when, after passing a qualifying examination, they are drafted to the pupil-teacher centre. Taking this secondary-school course into account, the Board has increased and improved the curriculum, until the Preliminary Certificate examination at the end of the pupil-teacher period is now almost on a level with a university matriculation examination from the standard of difficulty, while it is considerably wider in scope.

Now the centres are demonstrably able to prepare the pupil teachers for this, and the best students for the university examinations, and have been specially designed for the working of the half-time system. They are generally staffed now with teachers possessing university or equivalent qualifications, and what is of equal im-

portance, the necessary experience in the work. Their genesis and gradual development alike are due to the Board of Education, at whose instance many teachers have been for years devoting their energies solely to them. Only for the last two years have the regulations been fundamentally altered, when suddenly, before time has been given to show even the first products of the improved conditions, the whole scheme is threatened with dissolution!

There are two distinguishing features in the new system. One is the insistence upon a continuous education at a secondary school up to the age of seventeen or eighteen (where they may enter into the corporate life of the school with children of nine or ten); the second, the corollary principle that no experience in an elementary school shall up to that age have been gained. The "bursar" is to be kept entirely free from contact with the system of teaching to which he is proposing to devote his life, and the question of fitness for the work is carefully to be kept from intruding itself. True, the head teacher of the secondary school must report that he is "not unsuitable" to become an elementary-school teacher; but from what we know of the minimum requirements in the past we may easily imagine what will satisfy this doubly negative qualification.

Now it is this second principle that practical teachers know something about. In no other profession is it obligatory to guard so carefully against contact with one's future work and environment. Apprentices and pupils are articled to the professions, and are allowed to get into touch with the business before seventeen or eighteen. It is true there are to be "student teachers," but these will not be permitted to breathe the atmosphere of an elementary school until the same age, and no doubt will, in many cases, become the relatively inferior teachers of the future. The others will go straight from the secondary school into a training college (at the early age of seventeen!), whence they will emerge two years later, to come for the first time into close quarters with one of the most difficult of all tasks, that of teaching large classes of young children in such a way as to satisfy the complex requirements of modern times, *for a living*.

This question of fitness or aptitude is crucial. Whether the bursar goes to college or becomes a student teacher, the time must arrive when he will be tried in the fire. Headmasters will not be predisposed in his favour when they have to give him a day off every week for his studies; and when in addition he proves, as he must in many cases, to be lacking in the qualities needed for the work, they will speak out plainly and emphatically, if not for his sake, certainly for the sake of their schools. This is an aspect of the question that ought to appeal strongly to the head teachers. Some of them are perhaps inclined to view their pupil teachers as troublesome rather than helpful; but if the Board of Education and the local education authorities see that the training is given

only in the best schools and under the best head teachers this danger will cease. At any rate the pupil teacher does not count on the staff, while the student teacher will do so, and any difficulty that is now experienced will then be accentuated.

But to parents it is a still more important question. For a boy or girl of eighteen condemned as unfit by the head teacher of a school it will be most difficult to find another career. In other words, only the well-to-do parent will be able to afford the experiment of allowing his child to take up a bursarship of £10 for a year. Few parents who can afford to make it will be inclined to do so when they consider the average salary of elementary-school teachers, and especially the Government superannuation scheme, which shows the parliamentary estimate of the profession which the bursar must declare his *bona fide* intention to follow.

Hence it is clear that local education authorities may expect but a feeble supply from this new source. The recognition of this fact has induced the Board to offer it only as an optional alternative to the pupil-teacher system, though many baits in the shape of grants are held out to tempt the authorities to accept it at once. It would, however, not be fair for the authorities to tempt parents, by an immediate monetary consideration in the shape of an increased bursarship, to embark upon an experiment that must inevitably in many cases result in disaster.

In conclusion, those who are connected with pupil-teacher centres have nothing but approbation for the Board's desire to improve the education of future teachers. But they believe the centres, under the new conditions, are quite capable of doing this work; they believe the attempt to divorce the student entirely from contact with his life's work, without regard to his fitness for it, to be a grave error; and to uproot a system before giving it a fair trial to be not only an act of folly, but also of injustice to those institutions that have been established, fostered, and regulated by the very Board that now is seeking their destruction.

THE USE AND ABUSE OF THE FAIRY TALE IN THE TEACHING OF LITERATURE.¹

By C. L. THOMSON.

IN one of Wordsworth's best-known sonnets, the poet, after speaking of the waste of time occasioned by trivial gossip, contrasts the interests of the "daily world's true worldlings" with those of children, whom he considers "more blest and powerful" because they live so much in the world of imagination. Wordsworth was apt to idealise the period of childhood, and what he says of it must be accepted with reservations; yet it is, of course, true that children have an extraordinary power of surrounding with a glamour of romance whatever material is at their hand. Since this faculty is so important a means

¹ A paper read at the Federal Conference on Education, May 29th, 1907.

of happiness to its possessor, and is found so much less frequently in adult life, it is worth while giving a good deal of attention to its cultivation and preservation.

Yet it is not so very long ago that fairy tales and romances, the proper food for the imagination of childhood, were looked at askance by educationists, and kept as something apart from school, fit only for hours of recreation. The stories in our reading books were exclusively instructive or didactic, and had very little literary value, either of subject matter or form. About ten years ago, however, a reaction set in. The ideas of German educationists began to reach England, and a new type of reading book, in which the fairy tale played a large part, came into use. The use of the fairy tale or romance in education we may now regard as an accomplished fact. What we have to consider at present is how it may be best used in forming a taste for good literature. The subject deserves some consideration, because in our enthusiasm for a new idea we have not always shown discrimination, and have been apt to welcome all the material that came to hand, if it could claim respect on account of antiquity or quaintness.

In the first place, then, we may ask what kind of fairy tales and romances shall be admitted into our curriculum. Will any story, however fantastic, bloodthirsty, or unmoral it may be, answer our ends, or shall we select from the vast storehouses of the world's fairy tales those which are especially fitted to guide the imagination into wholesome ways? Again, are we justified in eliminating from some of these great fairy tales such episodes as, to say the least, have no elevating influence on the childish mind? I think it is worth while to come to some decision on this matter, because I have heard many teachers urge that questions of this kind do not trouble children. They accept the lies and cunning by which the heroes of these stories attain their ends with the same equanimity as they accept their wonderful feats of arms. But from the experience of many years' teaching of literature to young children, I can affirm that this is not always the case. Sooner or later the question comes from some thoughtful pupil, "But it wasn't right to tell that falsehood!" or, "Wasn't it very unkind to do that?"—the very same sort of problems that confront the mother when, in telling Bible stories to her children, she comes to the tales of Hagar and Ishmael, or Jacob and Esau, which, if she wants to defend the integrity of her heroes, she must explain away in some more or less ingenious manner.

Therefore I think some discrimination should be shown in the choice of tales presented to children. Our fairy tales and folklore were the product of primitive times, and thus, while they inculcate the special virtues of those primitive times, courage, patriotism, and generosity, they dwell with equal emphasis on bloodthirsty and horrible details. Again, many of them are of Oriental growth; they glow with the splendour of the gorgeous East, and for that reason make

an especial appeal to the imagination; but their heroes are sensual, cunning, and avaricious. Are these heroic qualities, and such as we wish children to attribute to those they would admire? By common consent we have banished one form of sensuality from our fairy tales, and have carefully bowdlerised the "Arabian Nights" in this respect. But are the failings of cruelty, trickery, and avarice to be admitted any more than grosser and more fleshly sins? We would not expect our pupils to expend their admiration on a drunkard; yet is excessive drinking a worse crime than unscrupulous lying?

Among the stories, then, which we may admit without question into our literature lessons, I would make the following selection. Of fairy tales pure and simple: "Beauty and the Beast," "The Sleeping Beauty," "Red Riding Hood," "Cinderella," "The Seven Dwarfs," "Snow White and Rose Red," and nearly all Andersen's stories, though a few of these, such as "Big Klaus and Little Klaus," which is actually repulsive, must be rejected. The collection of the brothers Grimm must be used with caution, for it contains much that is quite unsuitable. Some Northern stories, which are little known in England, but have much of the charm of Andersen's, are those of Zacharias Topelius; unfortunately not many of these have as yet been translated.

So much for what may be called the nursery tale; you will see that I have eliminated some very well known ones, notably "Bluebeard" and "Jack the Giant Killer." I do not say that in the hands of a skilful teacher even these might not be profitably used, but we must remember that, at least in our primary schools, the lower classes, where these fairy tales are generally read or told, are often taught by young and inexperienced persons, whose own taste is not always unimpeachable. I remember talking to a teacher one day about the pleasure of little children in fairy tales, and he answered, "Yes, they delight in them—especially the bloodthirsty ones"; and I have known teachers to dwell on these horrors simply to thrill the class.

With regard to the great cycles of romance, I think the following might enter our curricula: the "Odyssey," with some details, such as the blinding of Polyphemus, softened down; *not* the "Iliad," because, taking it as a whole, it deals too exclusively with combats; most of the Greek myths—Persephone, Perseus, Phaethon, Narcissus, and so on; the Argonauts; the exquisite story of Eros and Psyche; and perhaps one or two stories such as that of Alkestis, from the dramatists. Roman literature, being chiefly derivative, offers less material, and what it gives is more sophisticated. Yet from Virgil we may take the stories of the Wooden Horse, the Harpies, Dido, Nisus and Euryalus, Sylvia and her Fawn, and Camilla.

About the "Arabian Nights" I am a little doubtful; yet one or two or these—Sinbad, of course—must be admitted. Generally speaking, however, they dwell too much on the material

side of things, offering always wealth and treasure as a reward either of industry or cunning, to be as acceptable as the other stories I have mentioned.

Of the European cycles of stories the Gaelic and the Celtic romances have hitherto received less attention than the others; one reason, I am told, being the difficulty of pronouncing the names. It is a pity that this should prove a stumbling-block, for the stories are of extraordinary beauty, and despite the inevitable details of fights and combats, which may easily be omitted in the telling, possess more spirituality than any others. "The Wonderful Story of the Life and Death of Cuchulainn," "The Sorrowful Fate of the Sons of Usnach," "Ossian in the Land of Youth," "The Children of Lir," the Voyages of Mael Duin and of St. Brancian, carry with them a glamour which I cannot remember to have found matched in any other literature. These are Irish or Scottish, but a similar charm attaches to some of the stories of the "Mabinogion" and to the whole Arthurian cycle, that wonderful contribution to world literature offered by the Celts of many lands.

The Teutonic stories are simpler, more straightforward and more easily intelligible, and probably for that reason they are better known and more popular. Nearly all the stories in the "Younger Edda" are available. The Sagas, on the other hand, are hardly meat for babes, the stories of the feuds between the first settlers in Iceland, though full of interest for boys and girls in their teens, being too complicated and too horrible for young children. One great English poem, however, is at last being recognised and utilised in the country which should be most familiar with it. The story of Beowulf, with its fine lessons of courage, magnanimity, patriotism and loyalty, is now tolerably familiar in our schools. Other Teutonic stories, which we know from allusions in the Beowulf poem to be of equal antiquity, are less suitable. In German schools, for patriotic reasons, much is made of the "Nibelungenlied." But, apart from the fact that the central motive, the jealousy between Brunhilde and Kriemhilde and its reason, is a theme unintelligible to children, the unlovely human qualities it illustrates render it undesirable.

Besides these world-cycles of romance there are two stories which are particularly suitable for young pupils: the story of Hiawatha and the story of Robinson Crusoe. "Hiawatha" is, of course, woven out of Red Indian myths, idealised by the poet. "Robinson Crusoe" is especially attractive to little children because it illustrates the activities of the natural man face to face with nature, and satisfies the creative imagination which is so strong in childhood.

So far I have dealt with the fairy tale and romance from the point of view of subject matter; but I would not be understood to have regarded them simply from the ethical standpoint. Only, from the wealth of material that lies at our hand, I think we should be careful to select that which

is beautiful both from the moral and the æsthetic standpoints.

Since the aim of all literature teaching should be to cultivate a sense of the beautiful, I would plead that even in the lowest forms literature should be treated as a subject worthy of attention on its own account; that a time should be definitely set apart for it, and that it should be used as material on which to exercise the child's power of expression and imagination. Though the subject of the literature lesson be only a fairy tale, we should treat that fairy tale as respectfully and with as definite an educational aim as, in the upper forms of the school, we treat a play of Shakespeare. I think it very necessary to dwell on this point, because in the teaching of little children it has been too much the custom to sacrifice this subject to others—to nature-study or history, or geography—as if it had no independent value of its own, and only deserved consideration in so far as it illustrated something else. Thus children have been made to learn inferior verse, and have been told inferior stories, simply because such stories and poems treat of some flower or animal which is the subject for nature-study at that time. But if we are ever to train the literary sense of our children, we must treat literature seriously from the very beginning; we must give them only the best; and we must deal with it in such a way as to make our children feel its beauty, and so create a standard of taste and judgment which will remain with them throughout life. Such treatment cannot be perfunctory or subsidiary to some other subject, and if the proper teaching of literature is incompatible with correlation, then I think that the principle of correlation should be sacrificed. Many of the nature myths are, of course, admirably adapted for correlation, and fit in with lessons on flowers or on geography. But do not let us abuse the fairy tale by relating vapid stories by uninspired writers simply because we know of no real literature which deals with what, I believe, is called in kindergartens "the natural object" under observation at that particular time.

Again, if we are to educate the taste of our children, we must be careful that even fairy tales are presented to them in a worthy literary form. As regards the old fairy tales, the simplest and most unsophisticated versions are the best; I have seen "Red Riding Hood" hopelessly vulgarised by the introduction of a love interest; and a little while ago, having set as one question in a paper for future pupil teachers the story of Cinderella for reproduction, I was very much disappointed to receive from ninety per cent. of the candidates a pantomime version, in which the two step-sisters—anonymous in the original—were distinguished by ugly and common names. We ought to do everything we can to guard against such vulgarisation, and so to train our children that they also will revolt against it.

As for stories from Greek and Latin and Teutonic literature, it is clear that the translations

of scholars are, *in their entirety*, unintelligible to children, and that some selection or modification must be made in the telling. But I think that in the recent enormous output of such stories retold for children, the modification and adaptation have gone much too far—so far that in very many cases the literary value of the originals has altogether disappeared. The adaptations are often very poor; the work is badly paid and sometimes anonymous; hence it is seldom undertaken by anyone with genuine literary feeling or possessing any scholarship. But adaptations, to be successful, should be made by writers acquainted with the original, who have won distinction in other fields of literature, who have an ideal of style, and who, while using simple language, do not try to write down to their readers. Children understand far better than we give them credit for, and if they do not comprehend the exact shade of every difficult word, it is better that they should meet these words and gradually learn their significance from the context than that the harmony of sentence and paragraph should be sacrificed. Good versions, suitable for children, of these cycles of romances do exist, but among the enormous number of such books they are as difficult to find as a needle in a bundle of hay. Teachers, therefore, must be at some pains to discriminate, and not be satisfied with the first that comes to hand. It must be remembered, too, that we want, first of all, good literature, not coloured pictures or an attractive binding; and that if these things are supplied at a very low cost, something must have been sacrificed—something not so obvious to the casual observer, but from our point of view far more important, and that is the literary matter provided.

To sum up. The chief points we have to keep in view in the use of fairy tales or romances as an introduction to literature are:

1. The selection of these tales; not all that comes into the net of folklore is suitable for our purpose.
2. The story must be valuable as literature, and must not be used simply because it illustrates some other subject.
3. It must be presented in a literary form.

STATE-AIDED SECONDARY SCHOOLS IN ENGLAND.

A PARLIAMENTARY Paper (Cd. 3538, price 1d.) containing a summary of statistics relating to State-aided secondary schools in England has recently been prepared by the Board of Education. The number of schools dealt with is 600, and the number of pupils in them, excluding pupil teachers, is nearly 105,000. Of this number, about one-quarter are below the approved four-year course, one-quarter in the first year of this course, and nearly another quarter in the second year of the course. After the second year, about one-third of the pupils leave; and the number in the fourth year of the course is only about 8,000, instead of the 26,000

in the first year. In courses above the four years' regulation there are nearly 3,600 pupils. Expressed in another way, the numbers show that roughly one-half of the pupils in the 600 State-aided secondary schools in England are in the first year of the approved course or below it, while about one-ninth are in the fourth year or above it.

It is evident, therefore, that the majority of the pupils in State-aided secondary schools in England do not stay at school long enough to complete their four-year course and derive the educational advantages which it aims at giving: in most cases at present the school career is truncated instead of being a completed structure. The statistics thus furnish a strong argument for the establishment of the higher elementary schools recommended by the Consultative Committee, which boys could enter at twelve years of age and leave at fifteen. There will always be a large number of parents who will expect their children to leave school at this age, and until courses of work are arranged to run to this age as the terminus, our system cannot be regarded as satisfactory.

We must, of course, have in addition schools in which pupils will remain until later ages, but the work undertaken will naturally be of a different scope and character. The four-year course in our secondary schools is constructed on the assumption that children who commence it will remain at school until they reach about seventeen years of age, whereas, according to the statistics just published, 80 per cent. of the pupils are under fifteen years of age, and only 20 per cent. are above this age. The Board has to confess, therefore, that the four-year course breaks down in actual practice, and is only taken by about one-fifth of the pupils in its secondary schools. The educational requirements of the four-fifths who leave school at about fifteen years of age are sacrificed for the benefit of the one-fifth that remain to complete the prescribed course.

Several other instructive points are brought out by an analysis of the statistics. Of the 105,000 pupils in the secondary schools to which the numbers refer, 24 per cent. had previously attended public elementary schools, and pay no fees at the secondary schools. About 30 per cent. had attended public elementary schools and pay a fee of some sort at the secondary schools, so that 54 per cent. of the whole number of pupils in State-aided secondary schools in England come from the elementary schools. About 9,000 pupil teachers are under instruction at the secondary schools, but are not included in any of the foregoing figures.

A memorandum on the management and character of the secondary schools under consideration, in respect of public control and freedom from denominational restrictions, forms part of the same Parliamentary Paper. It appears from this that out of the 600 State-aided secondary schools, 157 are provided by the local authority, 19 are municipalised endowed schools, 335 are ordinary endowed schools, and there are

89 other schools. So far as can be ascertained, in 23 schools there is a provision that the head or assistant teachers shall be members of a particular denomination, 71 provide that denominational instruction shall be given in the school, and 8 are subject to a provision that all or a majority of the governors shall be members of a particular denomination. The sectarian difficulty, however, is not prominent in secondary schools, for so far as the Board possesses information it is believed that in many, if not most, of the ordinary endowed denominational schools (75 in number), the religious instruction given has no pronounced denominational character, and there is little to distinguish them from undenominational schools.

ENGLISH LITERATURE.

REPRINTS, ANNOTATIONS, AND CRITICISMS.¹

AIDS to the study of English literature—whether in the shape of attractive reprints, annotations, or critical studies—multiply apace. From among the most recent we select a number for consideration here.

The place of honour may fitly be given to Prof. Raleigh's "Shakespeare" (1)—one of the very best volumes ever published in that generally admirable series, "English Men of Letters." It is a book that every intelligent reader should enjoy; but only those who know their Shakespeare well can fully appreciate its excellence. Indeed, one might go further and say that only those who are familiar with a fair proportion of the vast literature that has grown up about and around Shakespeare can understand how much Prof. Raleigh must have read and digested—and happily forgotten or dismissed—before he wrote this book. There is not the least parade of learning; references, whether to line and play, or to commentators and critics, are conspicuously absent: but the learning has been assimilated, and has left Prof. Raleigh free to look at the plays again for himself and form an independent judgment. The consequence is that he writes with an easy mastery of his subject that makes his book delightful reading. Its distinguishing character may be expressed in a sentence. It is an attempt

¹ (1) "Shakespeare." By Walter Raleigh. vi+232 pp. (Macmillan.) 2s. net.

(2) Ruskin's Works: "Modern Painters," 5 vols. With Introduction by Lionel Cust. Vol. i., lxxiii+257 pp.; vol. ii., xxiv+374 pp.; vol. iii., xviii+325 pp.; vol. iv., x+389 pp.; vol. v., x+368 pp. "Stones of Venice," 3 vols. With Introduction by L. March Phillipps. Vol. i., xxix+380 pp.; vol. ii., 363 pp.; vol. iii., 313 pp. "Unto This Last, and Other Essays," With Introduction by Sir O. Lodge. xxiv+311 pp. (Everyman's Library, Dent.) Cloth, 1s. net, leather, 2s. net, per volume.

(3) "Spenser." By Rev. W. Tuckwell. 85 pp. "Dante." By M. L. Egerton Castle. 110 pp. (Bell's Miniature Series of Great Writers.) 1s. net each.

(4) "Richard II." Edited by A. F. Watt. xxx+158 pp. (University Tutorial Press.) 2s.

(5) "As You Like It." xxxviii+152 pp. "Merchant of Venice." xlii+143 pp. Edited by E. C. Black and A. J. George. (New Hudson Shakespeare, School Edition. Ginn.) 2s. each.

(6) "The Pearl." Edited by C. G. Osgood. lix+202 pp. "Early Sixteenth Century Lyrics." Edited by F. M. Padelford. lvii+174 pp. (The Belles-Lettres Series; Section II., Middle English Literature. Heath.) 2s. 6d. net each.

(7) Tennyson's "In Memoriam." With Analysis and Notes by H. M. Percival. xxii+185 pp. (Macmillan.) 2s. 6d.

(8) "Ballads and Poems illustrating English History." Edited by Frank Sidgwick. viii+212 pp. (Cambridge University Press.) 1s. 6d.

to find the expression of Shakespeare's personality in his writings—not by ferreting out allusions to particular incidents that may have occurred in his life, but by recognising that a writer reveals himself best in what is evidently written with the full strength of his mind and heart. "As we grow familiar with his work, we are overwhelmed by the sense that we are in the presence of a living man."

Prof. Raleigh, by the way, commends the "alert and rapid" reading of a play for the sake of the wholeness of impression secured by that method. One would like to see this plan tried more often than it is in school lessons in English literature, and not with plays of Shakespeare alone. The expense involved has hitherto been an obstacle in most schools; but such an enterprise as "Everyman's Library" makes the obstacle less serious. Why should not a fifth or sixth form be taken through the whole of "The Seven Lamps of Architecture" in a term? They would probably enjoy it far more than fifty pages exhaustively treated, and the sum total of what they carried away would not be less. If in addition they acquired the power of "alert and rapid" reading for themselves they would have learnt a valuable secret not often mastered at school. Messrs. Dent's editions of Ruskin (2), with their excellent reproductions of the original plates, are a marvel of cheapness. Five shillings will buy the whole of "Modern Painters," which a few years ago could not be purchased for five guineas. It would be difficult to suggest a better prize for a boy or girl of literary or artistic tastes. Two commendable features of this edition are the bibliography and the index. The utility of the introductions by various eminent hands is more doubtful. But if some of them are as tedious and superfluous as the chairman's speech which stands between the audience and the lecturer, an exception must be made in favour of Mr. March Phillipps's preface to the "Stones of Venice." This exactly strikes the right note of enthusiasm tempered by criticism, and cannot fail to be helpful to many readers.

Messrs. Bell's two dainty little volumes on "Spenser" and "Dante" (3) deserve a warm word of praise. They are modest performances, but in each case they are the fruit of first-hand study and enlightened admiration. Such introductions are sometimes objected to on the ground that their readers may be satisfied to have read about the poets without reading the poets themselves. The fear is groundless. It is simply inconceivable that any potential student of Dante or Spenser would be deterred through the reading of Mrs. Egerton Castle or Mr. Tuckwell; and it is quite certain that some who would not have tried Dante or Spenser for themselves will be persuaded into doing so by the delightful extracts and descriptions here given.

The Rev. A. F. Watt's "Richard II." (4) is a very practical edition of the play, not overburdened with notes, but giving all necessary help. It is also a thoroughly sound, scholarly and inde-

pendent piece of work. But why does Mr. Watt disguise Dr. Abbott, on whose "Shakespearian Grammar" he has very properly drawn, as "Mr. Abbot"? The editions of "As You Like It" and "The Merchant" in the "New Hudson Shakespeare for Schools" (5) have a well-printed text with notes at the foot of the page. The notes are interesting, though too full of textual criticism for ordinary school purposes, and leaving some of the difficulties of beginners untouched. The introductions are elaborate in their treatment of the sources and in the analysis of character; they are the work of competent American scholars, and very clear and systematic in arrangement.

To the keen interest of America in the study of English literature we also owe the "Belles-Lettres Series" of Messrs. Heath (6). Everything that a publisher can do in type and paper, binding and form, to make learning attractive, is done in these charming volumes. Of "The Pearl"—described by F. T. Palgrave as "perhaps the most purely and ideally beautiful specimen of our elder poetry which good fortune has left us"—there have been two editions in England from the unique manuscript in the British Museum, but both are expensive. Dr. Osgood, the American editor, has worked afresh from the manuscript through photographs made for him in England, and claims to have corrected errors of detail in both of the earlier editions. He has not given a translation, but the glossary and notes are so full as to make a translation unnecessary. The introduction is written with delicate feeling as well as knowledge, and altogether this volume should win many new admirers for a poem which is as precious and delightful as the name by which it is called. Another important contribution to the textual criticism of "Middle English" is made by Dr. Padelford in his "Early Sixteenth Century Lyrics." He has taken his selection, which comprises the best poems of Surrey, Wyatt, and the other courtly poets, from the manuscripts and earliest editions. The notes deal fully with the Italian sources of the poetry.

Mr. H. M. Percival's edition of "In Memoriam" (7) contains a good analysis and notes that are mainly concerned with the interpretation of the text—the elucidation of ambiguities in the expression or obscurities in the thought. It is a really original contribution to the study of the poem, drawing comparatively little from previous commentators.

Several good collections of historical and patriotic poems for schools already exist, but Mr. Frank Sidgwick's volume of "Ballads and Poems illustrating English History" (8) justifies itself by its inclusion of several interesting and un-hackneyed ballads. The chronological order adopted is not an order of composition, but of historical events. This has its obvious conveniences, and the teacher who attends to Mr. Sidgwick's hints in the preface can easily save his pupils from that confusion between the traditional and the artistic ballad which otherwise might be the resulting drawback of this arrangement.

THE EARLY STUARTS.¹

THE period of the early Stuarts is at last coming to its own. It has long been in the hands of polemical writers. Hume wrote his history of the period to justify George III. in his attack on the Whig oligarchy and his endeavour to restore personal monarchy. Hallam wrote his Constitutional History to answer Hume and to justify the Whigs of 1832 in effecting the revolution of that year by which personal monarchy was for ever rendered impossible. Because he was, like all Whigs of his time, quite indifferent to theological or ecclesiastical questions, and because as a lawyer he wrote in legal form, he earned the title of the "judicious." But the man who could speak of warring theologians as "angry insects," over whom "it was expedient for the State to scatter a little dust," and thus describe the silencing of the Convocations of the English Church, was quite incapable of writing the history of the later stages of the English Reformation. Carlyle began to throw light on the period when he unearthed Oliver Cromwell from the obscure grave in which he had lain so long, and published the text of his letters and speeches. It is not so long since death cut short the work of S. R. Gardiner, who has, at least for our generation, told the story of the Puritan Revolution as it should be told, not merely with the judiciousness of Hallam, but with sympathy with the theological and ecclesiastical ideals of the warring parties of the seventeenth century. He has been followed by a number of writers of various kinds, among whom Prof. Frith is the greatest, and Prof. Montague would be the first to acknowledge that but for Dr. Gardiner's work, his own would have been impossible.

Here, then, in this seventh volume of the Political History of England, we have a summary of our latest information on the reigns of James I., Charles I., and Oliver; and the story is well told. Specially would we direct attention to the remarks on taxation (p. 36), on impeachment (pp. 101, 119), on the prisoners of 1629 (p. 163), and on the religions of the Scottish Highlands (p. 204), all of them matters on which our text-books so far have been vague and unsatisfactory. We should have been glad of more detail about the Pilgrim Fathers (pp. 107-8), and we think Prof. Montague might have added to his sympathetic account of Laud some mention of George Herbert and of the Little Gidding community, which would have helped his Protestant Nonconformist readers to understand that Laud's ideal was not exclusively his own. We think his account of the sects in 1641 (p. 250) somewhat exaggerated because it omits the more orthodox of them, and we should like to know his authority for his statement on p. 323 that the Independents were willing to tolerate Roman Catholics.

The volume includes, like others of the work,

¹ "The History of England, 1603-1660." By Prof. F. C. Montague. xix + 514 pp. (Longmans.) 7s. 6d. net.

a very full and discriminating bibliography, but here we miss such books as Hanbury's "Historical Memorials relating to the Independents," and the publications of the Hanserd Knollys Society. Finally, to end our fault-finding, we would ask if a bill of the rebel Parliament became an "ordinance" before it was passed (p. 305), and if Mr. Glass has not, in his account of the Barebone Parliament, satisfactorily proved that Barebone's name was not Praise-God, but only Praise? We have mentioned these matters in hope that some of them may receive consideration before a second edition is required, not with any idea of detracting from the value of this volume, which, with its fellows, should find a place on the shelves of all teachers who wish to give their pupils true ideas of the history of England.

MARY CHRISTIE.¹

AMONG the women of the later Victorian period who have rendered notable service to the cause of education in England, the name of Mary Christie deserves to be held in grateful remembrance. Her chief work, the Art for Schools Association, founded in 1883, lives after her; and one hopes that it has a long career of usefulness before it still. How much it has accomplished, directly and indirectly, for elementary schools may be gathered from the story which Mr. Storr recalls as having been told by Sir Joshua Fitch at the drawing-room meeting which saw the inception of the movement.

In an inspectorial visit to a London Board School he had commented on the bare walls. When he went the next year the headmaster called his attention to the change and explained to him how it had been wrought. "After what you said, sir, I went round to the advertising agents and persuaded them to give me the pick of their coloured advertisements in the railway stations."

But if the Art for Schools Association is her best and most imposing memorial, Mary Christie left behind her other tokens of a life rich in activities, especially in the shape of literary contributions to the *Spectator*, *Guardian*, and other journals, and of letters to friends in which she revealed a remarkably original and attractive personality. Out of these materials her friend Miss Withers has put together a volume of varied interest and much charm. Miss Withers herself contributes a biographical sketch, the more effective from the restraint and self-suppression with which it is written. Mary Christie's thoughts about the deeper things of life are expressed in a series of intimate letters to a friend, and in "The Story of a Return" (from agnosticism to Christian faith) she writes, apparently at the request of the same friend, a very striking chapter of autobiography. The rest of the volume consists of selected articles and poems. The paper on Cor-

delia, which gives its title to the book, is perhaps the least attractive: it exemplifies the common fallacy in Shakespearean criticism—the fallacy of treating Shakespeare's creations as if they were natural phenomena. But whatever her subject, Miss Christie's thoughts were always her own; and all these papers and verses, readable for their own sake, are additionally interesting for the light they throw upon their author.

THE FEDERAL CONFERENCE ON EDUCATION.

THE conference organised by the League of the Empire proved a great success. The meetings were in progress as we went to press last month, and it was consequently impossible to summarise the proceedings and conclusions of the conference in the June issue of *THE SCHOOL WORLD*.

It is understood that a strong desire has existed that official conferences on education, consisting of representatives sent by the various Governments throughout His Majesty's dominions, should be held at regular intervals, and that the first of such conferences should be convened by the Imperial Government.

We are officially informed that an announcement was made on behalf of the Government to one of the conferences of education representatives of various Colonial and Indian Governments and of the Home Government, held by invitation of the League of the Empire, that His Majesty's Government considered it desirable to arrange for an Official Education Conference to be held in the year 1911. The Secretaries of State for the Colonies and for India are preparing to send out intimations to that effect.

From a statement issued by the official conference we select the information likely to give a general idea of the results arrived at. The meetings were held at Caxton Hall from May 25th to June 1st. The conference consisted of representatives nominated for the purpose by the several Governments or education departments, and held its meetings in private. Mr. S. H. Butcher, M.P., chairman of the council of the League of the Empire, presided as chairman throughout, and Mrs. Ord Marshall, hon. secretary of the League, attended as secretary.

The first meeting was devoted to settling procedure at the official meetings and to the selection of subjects for discussion. It was decided that the larger subjects which it was desired to discuss should be taken in full conference, and that certain subjects of a more special nature should be discussed in three committees consisting respectively of those representatives in whose countries these subjects were of chief importance.

The morning meetings on each day were devoted to sessions in full conference, and the committees met in the afternoon, and resolutions were only put when it was clear that the conference was prepared for a unanimous decision.

On the morning of May 27th the subjects of discussion were: "(a) the mutual recognition of teachers' certificates" and "(b) the interchange of teachers and inspectors." Under (a) the conference was asked to consider "whether, in order to facilitate interchange of teachers, practical steps could now be taken to promote a larger degree of mutual recognition of the teachers' certificates issued by different educational bodies in various parts of the Empire; and whether in the case of individual teachers more might be done by the education depart-

¹ "A Tardiness in Nature," and Other Papers. By Mary Christie. Edited with Memoir by Maud Withers. 331 pp. (Manchester: University Press.)

ments concerned to sanction provisional recognition of one another's certificates for short specified terms, the renewal of such recognition to be contingent on favourable reports being received from inspectors who have observed the teacher's work." After a considerable interchange of information as to the manner in which certificates in the various countries were awarded and their value equated, the conference came to the conclusion that the variety of local conditions, especially in regard to such matters as the tenure of teachers, their method of appointment and promotion, and similar points, made it impossible to arrive as yet at any complete system of mutual recognition of the teachers' certificates issued by different educational bodies in various parts of the Empire.

As regards (b), the conference was asked to consider "how far interchange of teachers and inspectors between different parts of the Empire would be feasible (i) for a short visit or (ii) for a term of years." It was resolved "that the conference considers it desirable that financial and administrative arrangements should be made for enabling teachers and inspectors of schools to acquire professional knowledge and experience in parts of His Majesty's dominions other than their own."

On May 28th the subject of discussion was "the possibility of closer uniformity of curricula, nomenclature, and methods of presenting official educational statistics." On the first part of this subject it was resolved "that, in the opinion of this conference, it is not desirable or necessary to take any steps to bring about uniformity of curricula or text-books for the different school systems of His Majesty's dominions." On the second part it was resolved that "it is desirable that the different education departments of His Majesty's dominions should define year by year, with precision, the terms used in the regulations and statistics that they publish and the basis upon which their published statistics are prepared."

The next three sittings were devoted to a careful investigation into the various ways in which the interests of education in the different parts of the Empire could best be furthered by encouraging closer relations and a more effective and continuous exchange of information between the several education departments. It was felt that the actual meeting together in conference of persons engaged in the administration of education for the purpose of personal interchange of information and ideas was of the highest possible value, but that there were also great advantages to be derived from having a permanent machinery for collecting and disseminating year by year information on various subjects in regard to the condition, development, and progress of education in the different parts of the Empire. The following resolution was agreed to: "That the delegates desire to express their appreciation of the value of this conference to the work of the education departments throughout the Empire, and resolve (i) that a quadrennial conference is desirable, (ii) that the representatives sent to the conference should be selected by the Governments, and (iii) that it is desirable that the first of such conferences should be convened by the Imperial Government." It was also resolved that "the conference is unanimously agreed as to the importance of a permanent central bureau of educational information."

A resolution was passed also "that this conference places on record its high appreciation of the work done by the League of the Empire in stimulating educational activity and in collecting and circulating information on educational subjects."

A summary is here added of the subjects discussed by the three committees of the official conference.

Committee A.—Problems affecting parts of the Empire in which there are large English-speaking populations: (a) The relative value of professional training and practical experience in the education of the teacher (i) for primary schools, (ii) for other schools.

(b) Rural education : (i) The training of teachers for rural schools; (ii) the provision of education in sparsely populated districts; (iii) the modification of the curriculum for schools in rural areas; (iv) (a) the relation of primary schools in rural areas to specific agricultural education of a higher type; (B) the provision of specific agricultural education for rural areas.

(c) Scholarships v. low fees in education other than elementary.

(d) Physical training (i) in elementary, (ii) in other schools; (iii) what should be the differentiation in regard to the sexes.

(e) Manual training and training for the duties of the home.

Committee B.—Problems affecting English-speaking populations in remote portions of the Empire: (a) the encouragement of higher education (i) by co-operation between neighbouring colonies; (ii) by the establishing of scholarships tenable in larger centres within the Empire; (iii) by the holding of examinations conducted by universities situated in other parts of the Empire. (b) Moral instruction. (c) Hygiene. (d) Co-education.

Committee C.—The bi-lingual problem, both languages being European.

RESOLUTIONS OF THE SECTIONS.

In addition to the meetings described, the consideration of technical questions occupied the attention of seven sections, each of which had frequent sessions, and in some sections resolutions were adopted. These are given below.

Nature-study Section.

(1) "As nature-study gives that wide knowledge of the world and its products which is required throughout life, it should be inculcated at all stages of sound general education, and this section recommends its earnest encouragement in the home, in the school, and in the outside world. Furthermore, this section trusts that the education authorities of the Empire will endeavour to extend and encourage knowledge self-gained from original observations, as a vitalising factor in the progress to full intellectual efficiency."

(2) "That the supply of teachers acquainted with true methods of nature-study being the greatest present requirement, special efforts be made to provide facilities for the proper preparation for the work of students and teachers in training."

Museums Section.

(1) "That the formation of school collections illustrative of science or art is a valuable aid to education."

(2) "That when school collections are made to illustrate natural history or other branches of knowledge, arrangements for the exchange of such collections between various parts of the Empire will assist the objects for which the League is instituted."

(3) "That teachers and others should discourage the making of such collections as might tend to the extermination of rare plants or animals, and should assist in preserving such objects by fostering a knowledge and love of nature."

(4) "That this conference recognises the value of arrange-

ments for the circulation of museum objects, as organised at the Victoria and Albert Museum, South Kensington, and at the Dublin Museum of Science and Art, at Sheffield Museum, and elsewhere, and warmly advocates an extension and development of the system."

(5) "That this conference recommends the organisation of a permanent collection of objects specially interesting and useful to those engaged in educational work, in connection with one of the great museums in London. That such a collection should include typical school museums and the outlines of a local educational museum."

University Section.

(1) "That this section desires to express its sympathy with Vancouver College in the severe loss which that college has suffered by the death of its Principal."

(2) "That this section desires to express its sympathy with the McGill University, Montreal, in the blow sustained by the University in April last in the destruction by fire of certain of its buildings."

(3) "That it is desirable that a committee representing universities should be formed to investigate the question whether it is possible to facilitate the exchange of information as to their courses and standards between the universities of the Empire, and to take action accordingly."

Teaching of English Section.

(1) "That this conference urges the importance of the study of the English language and literature as an essential part of school training on the grounds of practical utility, an enlightened patriotism, and the human ideal in education."

(2) "That in the teaching of living languages the direct system be used, with occasional explanations in the mother tongue of the pupil, when it is evident that the latter has not understood the teacher."

(3) "That the object of the teaching of English should be to develop in pupils the power of thought and expression, and the power of appreciating the content of great literary works, rather than to inculcate a knowledge of grammatical, philological, and literary detail."

(4) "That fairy tales, skilfully used, provide a valuable means of literary education for young children."

CONFERENCE OF HEADMISTRESSES.

THE Incorporated Association of Headmistresses held its thirty-third annual conference on June 7th and 8th at the Grey Coat Hospital, Westminster. After the transaction of formal business, which included the adoption of the annual report and the announcement of elections to the executive committee, the president, Miss F. Gadesden, headmistress of Blackheath High School, delivered her address, in which the question of examinations occupied the chief position. She said that the opening of university examinations to women has resulted in an extraordinary improvement in the highest as well as the average work of girls' schools. Of this the examiners have been only too ready to take advantage. Year by year the amount of work required in preparing for university certificate examinations, especially scholarship examinations, and the difficulties of the papers, have increased, until the relation between the object attained and the effort to gain the object is out of all proportion. Examinations have become as much tests of endurance, physical fitness, and health as of intellectual merit and efficiency, and entail risks to

brain and body which, in the interests of the future citizens, it will be well to avoid. Miss Gadesden then referred to the system adopted by the Board of Admiralty in the selection of cadets, and by some local authorities for the award of scholarships, and commended some such scheme as the following :

(1) The recommendation of the teacher given through "records" which represent the results of the scholar's work for a considerable space of time.

(2) An examination of the "records" by a board from which the teachers should not be excluded, followed, if necessary, by an interview with the candidate.

(3) Short examination papers on certain subjects to test ability and proficiency of a certain kind.

Miss Gavin, Notting Hill High School, introduced a discussion on the training of secondary-school teachers. Papers on this subject which were read at the conference last year had been circulated, and the discussion was continued from last year.

On June 8th the proceedings opened with the election of Mrs. Woodhouse, Clapham High School, as president for the years 1907-9. Miss Burstall, Manchester High School, chairman of the meeting of members of the association who are members of education committees, held on June 7th, presented the report of the meeting, at which the following resolutions were carried :

(1) "That it is desirable to encourage the establishment of more higher elementary schools and fewer secondary schools."

(2) "That in both higher elementary and secondary schools it is better to deal separately with boys and girls."

Miss Leahy, Croydon High School, spoke on the educational value of the curriculum for the first and second years of the four years' course arranged by the Board of Education. The discussion which followed resulted in the unanimous adoption of a resolution "that this meeting records its emphatic disapproval of the very definite manner in which the curriculum and time-table of secondary schools are now governed by the regulations promulgated from time to time by the Board of Education. It is profoundly convinced that the destruction of the initiative of the teacher which is thus being effected must result in much stagnation of educational thought at its principal sources."

The following resolutions were carried unanimously :

"That this conference regards as most unsatisfactory the limitation of sphere and inferiority of status assigned to women on the inspectorate of the Board of Education. It is of opinion that duly qualified women should be eligible for places in all grades of the Board's inspectorate, and that vacancies should be advertised or otherwise published in order that the highest attainable excellence in the appointments should be secured."

"That a committee be appointed to consider the means (if any) of bringing the heads of secondary schools for girls in the Colonies, India, and the Dependencies, into touch with the Association of Headmistresses."

"That the conference would welcome on educational grounds the substitution of the metric system for that of existing imperial standards."

Papers were read by Miss Clay, Queen's School, Chester, and Miss Taylor, County School for Girls, Tonbridge, on "Discipline: what is it, how is it best maintained?" and by Miss Dove, Wycombe Abbey, and Miss Walker, Roan School, Greenwich, on "The Modern Girl: how are we fitting her for her varied duties in life?" both subjects being discussed by the conference.

The conference will meet next year at the Manchester High School.

GEOGRAPHY IN EDUCATION.¹

THE question upon which I desire to concentrate attention is whether geography shall be accorded a place alongside of other sciences amongst the subjects eligible by candidates for the examinations which admit to the Civil Services of this country and its dependencies. For a good many years the Foreign Office stood in an exceptional position amongst the Civil Services of the Crown by including geography amongst the subjects for the entrance examinations of candidates. The Foreign Office, indeed, went further by making a pass in this subject compulsory. It was a reasonable matter of hope that, with the advance of education and the widening of public opinion, the enlightened example of the Foreign Office would be gradually followed by some of our other public departments. The announcement was made, however, a short time ago that uniformity was to be secured in the system of examinations for all the public services, not by levelling up to the standard of the Foreign Office, but by the opposite process of levelling down. That has been our characteristically British method. After June, geography will cease to be a subject which candidates for the Foreign Office may select even voluntarily.

I am concerned to make it clear that the question is one of far wider importance than as merely affecting the efficiency of certain of our public services. That this fact has been so little recognised is, I think, due to a natural and even commendable repugnance on the part of cultured minds to admit that our educational systems, based nominally and to a large extent really on intrinsically sound educational principles—such as developing the thinking powers of the student, strengthening his judgment, quickening his perceptive faculties, and cultivating his memory—have also necessarily rested largely on what, for want of a better phrase, I must describe as financial considerations. These fall into two divisions.

The first of them affects directly only the universities, but it affects indirectly the educational systems of all the non-State-aided schools in this country, as these, for various reasons, base their systems entirely on those adopted by the universities. It is a serious misfortune that but few of the latter have been in a position to set apart sufficient funds for the endowment of a chair in geography or a school of geography. Yet I do not know of a single instance of a university in the United Kingdom which is indifferent on this question of geographical education. So far as I can gather—and I have taken considerable trouble to ascertain the general trend of feeling—nothing but the want of money prevents any of the universities from following the examples of Oxford, Cambridge, and London. But in most cases the too scanty funds are already appropriated to older established branches of study which no thinking man would wish to see starved.

The other division of financial considerations to which I alluded just now is of a less simple nature, but it is not less effective in blocking the progress of geographical education and the introduction of this subject into the list of those eligible by candidates for the public services. To avoid misapprehension on this point, let me premise that I am not dealing at present with the educational systems of our State- or rate-aided schools which are not dependent on the favour of parents or subject to competition with other schools. It will suffice to confine our attention for

the moment to private schools, public schools, and, to some extent, universities, that is to say, to institutions where the sons of the leisured classes, or the well-to-do classes, are brought up, and from which strata our educational ideas and systems have invariably filtered down to the less-favoured classes which are waging a daily struggle for bare existence.

With rare exceptions, every educational institution not supported by public funds has to some degree—though a varying degree—to strike a tacit bargain with the parents of its students, the parents paying the money on which the prosperity or, most frequently, the existence of the institution depends, and requiring in return, in the vast majority of cases, that their boys shall receive such instruction as shall best enable them to compete on equal terms with their fellow students. The proprietors of private schools, the governing bodies of public schools, and even, though to a lesser extent, the universities themselves, cannot therefore afford to give the same prominence to a subject which carries no marks in the civil and military examinations that they give to subjects which carry such marks. On the other hand, the Civil Service Commissioners naturally hesitate to demand proficiency in a subject which holds only a secondary position, or sometimes no position at all, in the educational institutions of the country; and the question thus moves in a vicious circle.

I do not, of course, imagine that all the sons of the well-to-do classes of this country compete in examinations controlled by the Civil Service Commissioners; but the proportion of them so competing is sufficiently large to affect very seriously the standing in the whole educational sphere of any subject according as it is or is not a means of gaining marks in the civil and military examinations; and it may, I think, be confidently asserted that if geography received the recognition which we desire, it would very shortly take its place in Great Britain, as it has long since done in the United States, Germany, and other countries, as one of the fundamental and indispensable elements in the education of childhood and youth.

That this has not been the case up to now is probably due to the unintelligent and unmethodical manner in which the subject was taught until some twenty years ago, with the result that the majority of those who are to-day in a position to speak with authority retain an entirely false impression of its scope and objects. Certainly, during my own school life, the hour in the week devoted to geography was universally anticipated with strong aversion as a dreary exercise of the memory in acquiring names entirely divorced from the realities of life, so that one of the most human and interesting of all branches of knowledge, intimately connected as it is with the history of mankind, with our present occupations, and with our future development, was presented to us as an arid and flowerless waste.

The new methods and conceptions of geography have been so frequently and fully placed before you by the most competent experts in our science that I must not attempt to summarise them in this brief address. I would recommend those who are not yet informed on this point to procure and study the questions in the examination papers of the University of Oxford. They will gather from them an idea of the true scope and value of the science, and they will probably find opening out before them new and unexpected lines of thought which will add materially to the interests of their own lives.

¹ Abridged from an address delivered before the Royal Geographical Society at the anniversary meeting on May 27th, 1907, by the president, Sir George Taubman Goldie, K.C.M.G., F.R.S.

HISTORY AND CURRENT EVENTS.

At the Colonial Conference in May last, Mr. Deakin, Premier of Australia, said that "Australian experience tended to show that abstract economics were as far removed from the ordinary world of politics as abstract mathematics from the trade of a carpenter." Exactly so. Just "as far removed" and no farther. In other words, as the carpenter dares not disobey the laws of nature as revealed in "abstract mathematics," whether he knows them or not, if he is to be successful in his carpentering, so the "ordinary world of politics" must be managed in accordance with the laws of human nature as set forth in "abstract economics" if we are not to run our heads against brick walls, and try to bring about a millennium in a hurry, instead of aiming at the ideal of the Prayer Book wish for Parliament that "all things may be . . . ordered and settled . . . upon the best and surest foundations." When the politician talks sneeringly about "abstract economics" we may begin to suspect him of a want of knowledge.

OUR criminal law is again being "amended." A few years ago the first important change in procedure was made by allowing the accused to give evidence on his own behalf. Now there is to be the possibility of appeal from the verdict of the "twelve men in a box," which has for many generations been regarded as the "palladium of British liberty." The change is not so great as might at first sight appear. For the new Appeal Court is regarded as desirable mainly to relieve the Home Secretary of the burden of being practically such a court with disadvantages peculiar to his position. But, nevertheless, our constitution is changing; and the change is being effected in our usual way. A grievance has been felt, and a means of redress is found, without regard to principles but with a wise regard for practical convenience. The remedy is found, in this case, by means of an Act of Parliament. Often it is worked out by judge-made law. But in either case there is no need for resort to extraordinary methods of "changing the constitution" as our cousins in America would have to use.

By the way, how old is this "trial by jury" of which we are so proud, and which we are beginning to suspect is not always the ideal perfection that we used to think it was? To be exact, when did it come about that, whereas the juries of the twelfth century, when we read of them in our text-books, consisted of witnesses, and at first of witnesses for the defence, they now consist of persons who know nothing of the case before they enter the "box"? It will probably surprise most of our readers to learn that the change was a slow and gradual one, and that the process was not complete until the reign of Anne. "Alfred and the first British Jury" should by now be regarded as finally dismissed, but it would be well to give occasional lessons to our pupils on the history of our criminal procedure, and so give ourselves an opportunity to get clear ideas on, e.g., the method of treating a burglar from the time he is caught until the moment that lands him in Dartmoor. Before how many juries does he appear?

WHEN mediæval kings first began to summon parliaments to which representatives were chosen by those whom they were to represent, the communities thus represented were classes of the people acting as such and called "estates." In the English Parliament, the only one of these mediæval institutions destined to survive into post-Reformation times, and in the modern imitations thereof which now exist in European countries, this method has

been set aside in favour of a representation of places. The mediæval parliaments resembled the Roman *comitia centuriata*, the modern ones are like to the *comitia tributa*. Now that Parliaments represent in a more or less confused way the general sense of the State at large the classes whose interests are ignored are developing other methods of representation. Opposed to the State, yet not powerful enough to make States, they are necessarily violent and "criminal." Does this explain the "labour" troubles in San Francisco and in France of which we hear nowadays? Does the presence of "labour" members in our own House of Commons point to a revival of *comitia centuriata* as a substitute for our present forms?

ITEMS OF INTEREST.

GENERAL.

IF progress in education were in direct proportion to the amount of discussion of educational topics which takes place, we should have reason to congratulate ourselves. But though every week seems to bring with it some important meeting in which educational affairs are the subject of deliberation, there is still little unanimity on many fundamental questions. This divergence of opinion showed itself in the speech of the president of the Association of Education Committees at the meetings held on June 6th and 7th. Mr. G. White, M.P., in his presidential address, referring to our national system of education, said the elementary side, which for many years made most satisfactory advances, has, in his opinion, during the past five years not only ceased to make progress, but has retrogressed, while secondary education in several of its branches has been very properly described by the Board of Education itself as being in a state of chaos. He expressed the conviction that this state of affairs is partly due to the lack of properly qualified and trained teachers, and he maintained that the Board has put a hindrance in the way of the local authority by ceasing to classify teachers in the certificate examination, thus leaving it without any guidance whatever as to the relative merits of applicants so far as those merits can be determined by examination. Other eminent authorities are of opinion that the abolition of classes in this examination has released the student from the need of limiting his reading to what "pays" in an examination, and given him time in which to acquaint himself with principles likely to guide him in his future work. The lack of "properly qualified and trained teachers" for secondary schools is more easily explained. When the profession of teaching in secondary schools is adequately remunerated, a higher type of student will be attracted, and there will be no difficulty in obtaining good teachers.

ALL students of education will agree with Mr. White that "the children should be taught to think for themselves," and this cannot be done unless we have teachers who have learned to think for themselves and are furnished with more opportunities for exercising this art than are now granted them. One of the first and most urgent problems, Mr. White rightly contended, is that of the provision of colleges on a broader basis, with more enlightened methods and the freer use of the university colleges in connection with them wherever this is possible, especial emphasis being laid upon the art of teaching. But these remarks had the elementary-school teacher specially in mind. Here again, so far as the teacher in the secondary school is concerned, it is a question of expense. Until the prospects of the secondary-school master

are much improved, it is unreasonable to expect university graduates further to extend their years of preparation by taking a post-graduate course in a suitable training college. Middle-class parents have yet to learn that good secondary education is an expensive commodity, and that unless school fees are increased substantially, it is impossible to pay adequate salaries to the teachers without the aid of rates or taxes.

THE executive committee has felt compelled to bring to a close the operations of the National Association for the Promotion of Technical and Secondary Education. Recent reports have indicated that, owing to decreasing income, such a closure might become necessary before long. The executive committee, having gone into the whole situation, unanimously adopted the following resolution: "That, having given their most careful consideration to all the circumstances relating to the affairs of the National Association for the Promotion of Technical and Secondary Education, the executive committee are of opinion that the time has arrived when they may properly retire from their active operations; and it is hereby resolved that the association shall be wound up on June 30th, 1907. The committee venture to congratulate the members upon the accomplishment of the primary objects for which the association was founded twenty years ago, and to express the conviction that, in the performance of the important duties which, as a natural sequence, have followed upon that accomplishment, the association has contributed largely to a greatly improved educational organisation and to a quickening of zeal for even more effective progress in that behalf." It was also resolved that a brief final report, embodying an audited financial statement and a list of the supporters of the association, should be prepared. This will be done, and the report circulated after the close of the current financial year.

THE first annual conference of the Association of Teachers in Technical Institutions was held too late in May to make a reference to the meeting possible in our last issue. We are glad, however, to take this opportunity of congratulating the officers of the association upon their successful discussions at Leeds. Mr. V. A. Mundella, of the Northern Polytechnic, London, the president for the year, delivered his presidential address. Among other topics with which he dealt was the scholarship question. The success of technical teaching, he said, depends upon successful primary and secondary education. A tremendous leakage is represented by the passing outside the pale of educational effort of children beyond the age of twelve, and the president urged that up to the age of seventeen secondary education, widely diversified to meet local conditions, the standing of pupils, and the wishes of parents, should be made compulsory. There would thus be a perfectly natural development of the child. Scholarships, he continued, do not meet the requirements, and grammar schools and public schools have no effect on the problem of secondary education, which is the provision of suitable schools for the 600,000 children who leave the present elementary schools, a number many times as great as that of the children in the recognised secondary schools. The examination system for scholarships is fundamentally wrong, besides being very expensive. It works out for the whole country at about £20 per scholar on the average, a sum almost twice as great as would maintain the child in a provided secondary school belonging to the local authority. An organised system of secondary education must be provided by every local authority in which every child has a place suited to its aptitude and to the

wishes of the parents. Higher technical schools, university colleges, and polytechnics must be provided in plenty and in suitable centres. There must be room for all, and an elastic system of scholarships and bursaries so that no one need sacrifice his opportunity on the ground of want of income.

EDUCATIONAL authorities and headmasters have been considering their liabilities under the new Workmen's Insurance Act which came into force on July 1st. The Association of the Headmasters of the Endowed Schools in the Midland Counties discussed the subject at their meeting in March last, and decided to urge the Cambridge University Scholastic Agency to take up the matter. The secretary of this agency now announces that he has made arrangements with a thoroughly trustworthy office whereby considerable saving may be effected on the charges made by most insurance offices. Such insurances may refer to all assistant-masters and assistant-mistresses, domestic servants, or other employees engaged in connection with educational work. Full particulars can be had from Prof. Lewis, New Museums, Cambridge.

AT the request of the Cardiff Education Committee, Sir Philip Magnus has reported upon the educational system of Cardiff. That part of his report which deals with the relation between the technical classes and the University College is mainly of local interest, but his remarks on the supply of secondary education have a bearing upon similar problems elsewhere. He points out that Cardiff is fortunate in having a scheme of secondary education which needs additions and improvements rather than the reconstruction which is necessary in some other places. The existing schools consist of two intermediate schools, one for boys and one for girls, and a municipal secondary school, which is at present a dual school. The intermediate schools have a fee of £7 10s. per year, and the municipal school of 6d. per week, an arrangement which produces a certain amount of social differentiation between the schools, but which appears to work well and to meet the views of two classes of parents. Sir Philip Magnus states, not only that there is room in Cardiff for the existing schools, but that even with the addition of a new secondary school for 500 scholars now building the provision of secondary education will not be in excess of the requirements.

THE demand for secondary education in large towns grows steadily, and the bitter opposition it encountered ten or fifteen years ago is dying out. Some of the growth is artificial, being due to the regulations which make sixteen the age for appointment as a pupil teacher; but the greater part of it is due to the fact that the elementary schools have at last realised that eleven or twelve, not thirteen or fourteen, is the proper age for transference to a secondary school. Boys and girls come earlier to the municipal and secondary schools and stay longer in them than they used to do, so that, although about the same number pass through the schools, yet the number in them at any given time is larger, and the education received, being of longer continuance, is more sound and thorough. Sir Philip Magnus recommends that in the new municipal school the education given shall be of a rather more practical type than that given in the existing school. While in general agreement with this, we doubt whether much can be done to alter present conditions; for the curriculum in the existing school is that of a modified school of science, and in such schools it is not desirable to reduce the small amount of time now given to English subjects and modern languages. Latin perhaps might be

dropped; but this would shut boys out from scholarships at the local university.

THE name of Prof. Michael Sadler is sufficient in itself to warrant attention to his pamphlet on "A Bureau of Education for the British Empire." His experience in the organisation of the Special Inquiries Department and his activity as a contributor to the publications of that Department lend additional weight to the opinions he expresses. This pamphlet had its origin in an address delivered at a meeting of the Liberal Colonial Club in December, 1906. In the first part he reviews the reasons that render advisable the establishment of an Imperial Bureau of Education. The "painful course of self-preparation" that necessarily precedes any great educational reform requires an interchange of experience and a careful observation of results obtained under the different systems that have been evolved in the various parts of the Empire. Moreover, "provided that the inner drift of things is toward imperial unity, well-directed educational influences can further the movement of public opinion in that direction." Prof. Sadler concludes that "What is wanted is an annual official report which will give a sufficiently detailed account of the educational systems of the British Empire." The second part of his paper discusses the work that the Bureau should undertake in this direction. It should, however, not only collect statistics, but also serve as a centre for propagandism. How far these two directions of activity should be united in one office, whether such a bureau as is contemplated should be officially connected with any existing Government department, are among the many other points that receive consideration. To direct attention to Prof. Sadler's paper is to render service to the causes of education and federation. To read it is to become imbued with its spirit.

THE report of the University of Oxford School of Geography for the year 1906 has now been published. The number of students on the roll during the year was: Hilary term, 60; Easter term, 21; Michaelmas term, 110. The totals on the roll in the corresponding terms of 1905 were 140, 149, and 39, most of whom attended only lecture courses. The number of students giving all or most of their time to geography shows a gratifying increase. Ten students in the Michaelmas term took the diploma courses, and three others took the certificate courses. The rapid increase of students giving most of their time to geography has necessitated the appointment of a demonstrator to assist the reader. The reader in geography has reported to the committee that on several occasions he has been asked to recommend men specially trained in geography for lectureships, masterships, and positions in colonial and other surveys. He has in most cases been unable to do so, as all those who have already taken the diploma or certificate in geography have already received appointments. More than £950 has now been spent upon plant, and in addition many gifts have been received. During 1906, 226 books and atlases and 859 sheets of maps have been added by purchase, and the total addition to the book and map collection for the year, including gifts, is 328 books and pamphlets and 978 sheets of maps, of which 882 are large scale maps. The school now possesses 1,898 books, atlases, and pamphlets, and 5,732 sheets of maps. The committee will welcome contributions to the collections of the school.

PRINCIPAL DAVID SALMON, of Swansea, is constantly at work on the origins of our elementary-school system. He has recently engaged in a very interesting inquiry on the influence of Joseph Lancaster and his monitorial system

in France. The results of his inquiry were first given in a lecture to the West Glamorgan Education Society last December, and have since been published in pamphlet form. The society which supported Lancaster was called the British and Foreign School Society, and Principal Salmon shows that the *Foreign* propaganda was not ineffective. The Rev. Dr. Schwabe, a German, was foreign secretary of the society, and spread the knowledge of "the system" in Germany, whilst in France the Société d'Encouragement pour l'Industrie nationale was ready and keen for inquiries into the English system. A deputation of the French Society was present at the half-yearly meeting of the English Society as early as 1814, and several of the members of the deputation made favourable reports. The following year a society was established in Paris—the Société pour l'Instruction élémentaire—on the model of the British and Foreign School Society, and by the end of the year 1815 Paris possessed five monitorial schools. Mr. Salmon presents us with the astounding information that before the end of the next year there were fifteen hundred monitorial schools in Paris and the provinces. Before 1816 the number of children receiving instruction in elementary schools in France is put at 165,000; in 1820 it is stated to be 1,123,000. "This is a result," says Mr. Salmon, "of which the French Society for Elementary Instruction may well be proud, and for which the British and Foreign School Society, so ready to aid and encourage, may take some small credit." Mr. Salmon does not concern himself with other forces at work in the development of the French system, but he undoubtedly makes good the very interesting relation which existed between England and France amongst the educationists at a time when the two nations were on the verge of a struggle to the death, politically.

AT a conference held on June 15th at the offices of the National Union of Teachers, between principals of university, residential, and day training colleges, and representatives of the executive of the Union and of the Pupil Teacher Centre Teachers' Federation, the following resolutions were adopted: (1) "That the university course be open to all matriculated students who satisfy the college authorities that they are able to profit by such a course without loss to their professional work." (2) "That students who have followed in college a university course shall be required to take an examination in a degree course, either during or at the close of their period of training; should a student fail to pass such examination, then his recognition as a certificated teacher shall depend on the report of the training college authorities on his work in college." (3) "That it is undesirable on educational and other grounds, whatever necessities may under the new regulations be forced on local authorities, that teachers should be made liable by bond to serve for a certain number of years in any particular locality." (4) "That it is important that the training colleges should be open to students from the whole country." (5) "That it is desirable to provide that the obligation of the student's declaration may be met by a definite term of service." (6) "That this obligation of service may be discharged in any State-aided or rate-aided school." A short discussion took place upon the desirability of training students for service as teachers in primary and secondary schools side by side.

THE Book List of 1907-8 for the Young People's Section of the National Home-Reading Union is now ready, and may be obtained from the secretary of the Union, Surrey House, Victoria Embankment, London, W.C. This list has been extended in order to give teachers a wider

choice of interesting material, the Union desiring to meet the needs of children in all conditions of life. Low-priced books have been selected mostly, therefore, consistently with their educative value and their suitability for young readers. Teachers in secondary and elementary schools will find the Union's courses of reading very helpful. The objective of the Union being self-activity in the form of home reading of sound literature, it wishes to increase the effectiveness of the reading lesson in the schools, and not only to broaden school education generally, but to prolong and confirm its influence.

THE Highland Railway Company has just issued an "A.B.C. Guide" which supplies all information likely to be required by a teacher proposing to visit the Highlands of Scotland. Fares are set forth in detail from all important railway stations in England and Wales to every station on the Highland line. Particulars are given of numerous circular tours by rail, steamer, and coach. A full list of free fishings and of golf courses is also included. A series of excellent photographic reproductions of beauty spots on the Highland Railway adds greatly to the interest of the guide. Copies may be obtained from Messrs. W. T. Hedges, Ltd., Effingham House, Strand, W.C., post free.

TEACHERS of geography who are purchasing wall maps would do well to examine the recent lists published by Messrs. George Philip and Son. A large variety of school-room maps is described in one list, and the large illustrations give an excellent idea of the maps themselves. A second well-illustrated pamphlet deals with a wide selection of atlases and sheet maps. Several novelties in map mounting are also explained in the catalogue.

THE Civil Service Commissioners announce an examination for fifteen appointments as assistants of Customs, commencing on August 27th. The latest date for making application is August 8th.

A MEETING of the London members of the Historical Association will be held at University College, Gower Street, W.C., on July 6th at 3 p.m., to consider the advisability of forming a London branch of the association. Mr. G. Laurence Gomme will read a paper on "History and Anthropology." Further particulars can be obtained from the secretary of the association, 6, South Square, Gray's Inn, W.C.

SCOTTISH.

IN the prefatory note to the Memorandum on the Teaching of Arithmetic in Primary Schools, issued by the Scotch Education Department, it is stated that the memorandum is not put forward as a final or authoritative document, and that criticisms and suggestions will be welcomed. We sincerely hope that teachers will accept this assurance as genuine, and that a new era of intelligent and sympathetic co-operation between educational authorities and teachers is being inaugurated. The aim of the memorandum is rather to indicate leading principles than to formulate a definite scheme of instruction; it is to be hoped that teachers will be granted a corresponding freedom in the preparation of detailed syllabuses, and that they will be allowed to deviate from these when the capacities of their pupils demand such departure. As regards the memorandum itself, the views it expresses will, in the main, be accepted by most teachers as sound and practicable, though possibly emphasis will not always be placed on the same things. Thus, we would emphasise more strongly the suggestions under Multiplication Table on p. 4. Again, we think the principle involved in the first sentence of the paragraph on series of equal fractions (p. 6) should be

made much more prominent; it is the cardinal principle for operations on fractions. The least satisfactory part of the memorandum, in our opinion, is that which treats of the general case of converting vulgar into decimal fractions; the process should be taken up as a case of approximations, of which it forms one of the best examples. We should have liked to see a caution against the reckless use of the word "answer." As a check, the habit of writing out the leading words of the question in concrete cases when giving the answer is very valuable, and it is also useful to make the pupil quite familiar with the difference between a sum and a product, &c.; it is too much the custom to label all examples as sums. The memorandum as a whole deserves the careful consideration of teachers; the more carefully it is studied the better will the teaching of arithmetic become.

THE annual report of the Scotch Education Department for the year 1906-7 has now been issued. The number of children on the roll for the past year was 806,737, and the number in average attendance 706,062. According to the estimated population, there should be about 944,000 on the registers and 787,000 in average daily attendance. That means that for every 100 children who might be on the registers, and for whom accommodation is provided, there are only eighty-five scholars on the roll and seventy-five in daily attendance. The Department seems to be unduly pessimistic as to these figures. Considering how many children are not sent to school until six (very wisely, we think), the number who are ill at the various ages and unable to attend, and the number being educated at home or out of the country, the above figures should give no cause for despondency. It is specially satisfactory to note that the average attendance, 87.52, is the highest on record, though it is probable that this is in large measure accounted for by the exceptionally mild winter. This year's backward and trying spring and summer have already seriously reduced the average attendance in most schools, so that next year we may be prepared for a considerable fall in the percentage. It is of interest to learn from the report that savings banks have been opened in 228 schools, the amounts standing to the credit of the pupils being £9,798. There are school libraries in 1,583 schools, with an aggregate of 333,000 books. It is satisfactory to find the Department making due acknowledgment of the generosity of Mr. James Coats, jun., of Paisley, in providing libraries for schools in the Highlands and rural districts generally. No benefaction in recent times has fulfilled so admirably the objects at which it aimed, none has been more appreciated, and none has been given with a more complete absence of ostentation and publicity. The number of certificated teachers is given at 14,084, of whom 4,737 are men and 9,347 women; 81.67 of the men and 58.4 of the women have undergone a course of training in the normal schools, and of the whole number of teachers 1,687 are graduates in arts or science.

DUNDEE School Board has resolved to institute a "vacation school" on the lines so successfully carried out in America. The management of the school is to be in the hands of a committee representative of the School Board, the Town Council, and the Social Union, and the expenses of administration will be met by voluntary subscriptions. The main idea of the scheme is to provide healthy amusement for the children in the parks, and to take them into the country or down to the seaside as occasion permits. In the event of bad weather the children will be gathered into schools set apart for that purpose. The work there will be entirely recreative, embracing such

subjects as singing, drill, dancing, sewing, and manual occupations. Dundee is to be congratulated on this forward movement, which might well be followed by other cities. The conditions of city slum life are so utterly opposed to the most elementary notions of how children should be brought up, that the heartiest sympathy and support should be given to every effort that will, for even a short time, remove them from their surroundings.

THE Code for Continuation Classes which has just been issued contains no changes of importance. Several minor modifications have been made, all directed to give greater freedom and elasticity in the working of these classes. It is definitely laid down that the normal length of the session should be not less than twenty weeks. If it is proposed in any plan to give less, the circumstances in which the shorter session is thought desirable should be fully stated to the Department. Article 3, which assimilated the instruction in Division I. to a well-arranged supplementary course, is further extended by the addition of a clause allowing the teaching of any other subject that may obtain the sanction of the Department.

THE Educational Institute of Scotland has forwarded a memorandum on the Education Bill to the Secretary for Scotland and to the Scottish M.P.'s. It is pointed out that the institute, representing more than 11,000 teachers, may well claim to speak in the name of the teachers of Scotland. The Bill, as a whole, comes in for very favourable comment. The provisions for the medical inspection of schools, the feeding of children, and the compulsory attendance of pupils up to seventeen years of age, are heartily approved. The Scottish Secretary is cordially thanked for the clauses dealing with superannuation, and more especially for the promised additional parliamentary contributions towards pensions. Regret is expressed that the Bill does not propose to improve the tenure of office of teachers by providing for an appeal to the Department in cases of arbitrary and capricious dismissal, and the hope is expressed that, during the progress of the Bill through committee, this point may be considered.

THE Department, after reconsideration of the question of changing the date of the Leaving Certificate examination, has decided in favour of the alteration. The examination for 1908 will begin on Tuesday, April 7th, and finish on Wednesday, April 15th. The Department, in the letter announcing this decision, adopts its favourite policy of charging all who opposed its views with being educational obscurantists who are hopelessly out of touch with sound educational ideas. It sets up bogey objections of its own creation, and then proceeds to knock them down. The change being now *un fait accompli*, it is useless to repeat the *real* arguments against it. They will be found crystallised into hard facts in the course of the next few years.

ADVANTAGE is taken of the alteration in date and the abolition of the honours paper to effect a redistribution of the papers in such a manner as to relieve the strain involved in such a long examination. The higher English will be broken up into three parts, the second and third of which will be devoted to history and geography respectively. (The Department may probably issue specimen papers in the last-named subjects in order to give teachers some general guidance.) In Latin, Greek, French, and German there will be substituted for the single higher grade papers of three hours' duration, two papers, for each of which two hours will be allowed. In French and German, candidates in the higher grade will have a dictation test included in their paper.

THE Edinburgh University vacation courses, which proved such a marked success last year, will again be held in the University during the month of August. The courses embrace lectures in French, German, and English, the language and literature of each receiving ample consideration. The staff includes no fewer than forty professors and lecturers, some of them with a European reputation. The month's course will consist of sixty-two to eighty-four lectures and lessons in each language. Full particulars may be had from the honorary secretary, Prof. Kirkpatrick, Edinburgh University.

IRISH.

THE Government's failure up to the present in the field of education is remarkable. Last year the English Bill went by the board, and this year the Irish Bill has disappeared far more swiftly and dramatically. For the Irish Council Bill was mainly an Education Bill. It was to the education clauses that Mr. Birrell said he attached the greatest importance, although the feature which seemed to attract public attention was what has been called devolution. The Bill proposed to unify the Boards of Primary and Intermediate Education, to abolish results' fees, and to co-ordinate their work. The merits of the Bill are not our concern here, nor whether the Nationalist Convention of Whitsuntide in Dublin was politically right or wrong in rejecting it; but the solid fact remains that a Government has at last made proposals for improving education, and was willing to make a grant to Ireland of £650,000, part of which would have been available for this purpose. We have, therefore, two admissions: (1) that the time is ripe and over-ripe for reform, and (2) that further funds are necessary. In the light of this there is no reason why wide administrative changes should not take place in Irish education, both primary and secondary, by which large improvements would be secured in the immediate future without waiting for a further Act of Parliament.

ANOTHER Government project for educational reform has for the present been even more unfortunate. Mr. Bryce's scheme for remedying the grievance in university education has died still-born, and has never even been introduced into Parliament. It has for some time past been apparent that this would be the case. The Prime Minister's statement in the House of Commons on this matter was somewhat vague, but it conveyed the impression that Mr. Bryce's scheme was abandoned for good, as he explained that Mr. Birrell would in the autumn spend his time in Ireland endeavouring to reconcile opposing interests and to discover a scheme which would please, or at least not displease, all parties. This is difficult; but the main elements of the problem are these. The Roman Catholic hierarchy will accept any one of three solutions: a separate university with a Roman Catholic atmosphere, a new college under Dublin University, or a new college under the Royal University, both the latter being, of course, practically Roman Catholic. Of these, the first is admittedly unfeasible for political reasons; the second, in the form of Mr. Bryce's scheme, has met with strenuous opposition from Trinity College; it remains to be seen whether a new attempt will be made on similar lines more likely to win favour from Trinity, or whether Mr. Birrell will fall back upon the third scheme, which seems to be the line of least resistance. The Government, however, has promised a new Bill for next session.

IT is a remarkable fact that during the past few years more and more attention is being given to secondary education in Ireland. Recently, no National Convention seems

complete without a resolution like that at the last meeting, "that the present system of intermediate and primary education stands in need of serious and immediate amendment, and that we desire to urge on the Government, in the strongest possible manner, the necessity of bringing it into consonance with the wants of the people and the requirements of the country, and of extending to it more generous and just financial assistance than it has yet received." Another sign of the times is the appearance in the *Northern Whig* of Belfast of a series of weekly articles dealing with intermediate education. These are published in each Saturday's issue. The first, dealing with its general condition, directed attention to the much-neglected report of Messrs. Dale and Stephens, advocated inspection, the abolition of payment by results, the establishment of registration, and a strenuous effort to raise the teaching profession to a position of honour and respect.

THE report of the Lord Lieutenant dealing with the Ireland Development Grant Act, 1903, for the financial year ending on March 31st, 1907, has been issued, and shows how this fund stands and how a fund voted to Ireland as an equivalent for a similar one for education in England has been transferred mainly to other objects. The balance from 1905-6 was £136,000, and the annual Parliamentary vote £185,000, making a total of £321,000. Of this, statutory payments to congested districts, land purchase, and similar objects swallowed £133,000. £7,000 was given to the Department for Technical Instruction, £28,425 for cost of assistant teachers in national schools and King's scholars in training colleges, £17,000 towards building grants for Marlborough Street Training College, i.e., about £52,000, or less than a third of the annual grant for educational purposes. Some more went for harbours and railways, making a total in all of £197,000, leaving a balance of nearly £127,000.

SHORTLY after Whitsuntide, Sir Horace Plunkett resigned the vice-presidency of the Department of Agriculture and Technical Instruction, and Mr. T. W. Russell now reigns in his stead. Sir H. Plunkett is one of the most unselfish patriots that Ireland has ever had, and will always have the credit of having started technical instruction and science teaching in secondary schools on a sure and sound footing. The report on the Department's work by the Government Commission has not as yet appeared. Evidence began to be taken on April 30th of last year and terminated on November 23rd.

A MEMORIAL fund has been started in Ireland in memory of Miss Alice Oldham. Miss Oldham was unsparing in forwarding the interests of female education in Ireland, and to her as much as to anyone of her sex belongs the credit of opening the doors of Trinity College to women. It is therefore fitting that her work should be commemorated, as seems likely to be the case, by a prize offered in Dublin University for women students who have studied for at least one year in Alexandra College, where Miss Oldham herself taught for many years. The secretary for the fund is Miss M. Joyst, 4, Oakley Road, Dublin.

THE work of the Classical Association in England is beginning to attract attention in Ireland, more particularly at present in view of the general adoption in England, Scotland, and Wales of the reformed pronunciation. In Ireland we suffer from a variety of pronunciations, and some years ago the temporary inspectors of the Intermediate Board reported on their inherent defects and the very common ignoring of quantities, and recommended the

use of some uniform system in schools. The faultiness of our intermediate system is seen in this, that in the absence of any form of inspection at present it has no power of enforcing any enlightened method of pronunciation; but a great deal of help could be given to the schools by the universities, and it is encouraging to know that both Trinity College and the Royal University are considering whether the introduction of the reformed pronunciation is practicable. Latin pronunciation is, however, only one of many reforms in classical teaching that require discussion.

WELSH.

At the last meeting of the Court of the University of Wales, a report of a committee was referred to the Executive Committee of the Court with regard to organised assistance to students entering on business or professional careers. The scheme suggested the formation of a committee for and at each of the colleges, and a combination of these as a university committee with a paid organising secretary. Such an organisation would collect necessary information about suitable openings for graduates in the public service and in commerce. The Executive Committee was asked to report to the Court as to the methods by which the above recommendations could be made effective.

THE following resolutions were passed at the half-yearly meeting of the Central Welsh Intermediate Education Board : (i) "That an application be made to the Board of Education for an amending scheme enabling the Central Welsh Board to undertake at the request of a local education authority the inspection and examination of any school in Wales and Monmouthshire aided or maintained under Part ii. of the Education Act, 1902." (ii) "That, subject to the ultimate control of the Board of Education as defined in the regulations relating to the Treasury grant, the inspection and examination of the Central Welsh Board be recognised for the purpose of all Imperial grants made to schools inspected and examined under the Central Welsh scheme." (iii) "That the Executive Committee considers that the system of duplicate inspection of schools is detrimental to their educational progress, and that the Board be recommended to appoint a committee to arrange for an interview with the President of the Board of Education." A deputation has since waited upon the President of the Board of Education with regard to the third resolution, and it is understood that the deputation received an entirely sympathetic answer.

MR. TOM JOHN, ex-president of the National Union of Teachers, has trenchantly attacked the attitude of the Glamorgan Education Committee. He describes the primary-school equipment of the county as a "stunted stump." After speaking of the necessity of county authorities mastering the difference between education and instruction, Mr. John continued: "I am deeply grieved that the theologians and the passive resisters are stagnating everything in the area of the non-provided schools. . . . The policy of starvation has been perpetrated long enough. . . . It is time to suspend hostilities and to hurry up supplies to the suffering children in all schools." This is a significant utterance, and, coming from Mr. John, will not only arouse attention amongst teachers, but also amongst public men.

In an application for a post under a Mid-Wales Education Committee, a testimonial was read in support of one candidate—a woman teacher—from a minister of religion. In the course of his letter the rev. gentleman said that, from his brief observation of the candidate's conduct, he

had no hesitation in bearing witness to her excellent qualities. She had a clear understanding, a steady, well-balanced judgment, and a reason far removed from prejudice. She was cheerful, modest, and in good humour without noise. She never lifted her voice in the streets, yet she was firm and resolute, void of all inordinate passions, full of tenderness, compassion, and benevolence. She was well beloved by her associates, and left a good influence upon them. He was fully convinced that she would equip (*acquit?*) herself with credit in any school, and, should the committee favour her with the appointment, he was sure they would have reason to rejoice in her services. With testimony to such gifts and graces of mind and character, the Education Committee is to be congratulated on appointing such a candidate; but it is hardly a subject of congratulation that the Education Committee gives her a salary of only £50 a year.

ONE of the signs of the times is the movement in connection with training colleges. Swansea Training College for Women Teachers has long been in need of more adequate provision of buildings and equipment, but the difficulty of obtaining funds has been great. Now the Education Committee of the town is negotiating with the authorities of the training college for its transfer to the Town Council, on the understanding that the committee undertakes to erect a new college within five years to accommodate 200 students, and to take over the staff on terms at least equal to the present. An arrangement is also made safeguarding the principles of the British and Foreign School Society's Royal Charter.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Cassell's New German Dictionary. Revised and considerably enlarged by Dr. Karl Breul. xvi+798+545 pp. (Cassell.) 7s. 6d.—It is with genuine satisfaction that we welcome the appearance of this work, after a long period of incubation. Dr. Breul has for some time past devoted almost all his leisure to the revision of this book, putting aside other tasks which might well have been thought more attractive. With rare pertinacity and conscientiousness he has toiled on, and to such good purpose that the present issue of the dictionary is rather a new book than a revised old one, and that it may justly claim to be the best German-English dictionary at a moderate price. We have no doubt that the publishers will be amply repaid for their sound judgment in choosing Dr. Breul to undertake this work; and Dr. Breul will receive the gratitude of many thousands of students and teachers for what was certainly a very difficult and exhausting enterprise.

The book is mainly intended for English-speaking students. This explains why the German-English section is half as long again as the English-German, and why the pronunciation of English words is not given. We should have thought that the book might have counted on a considerable Continental sale if the two languages had received equal attention, and that it could in consequence have been increased in bulk without a raising of the price. From the English point of view, however, the course decided upon presents no drawbacks. For those who desire to translate a straightforward piece of English into German the English-German part will probably be found quite sufficient; and when it comes to translating difficult English, there is no dictionary elaborate enough to make it certain that the result will really be first-rate German.

The care given to the grouping of the various meanings of a word is wholly admirable, and represents a great improvement on the older version of the book. A number of words and phrases have been added, and some superfluous ones omitted. The case required in particular phrases after certain German prepositions has been added —a great boon. Due attention has been devoted to the spelling. The only blot on the book is the retention, at the express wish of the publishers, of the "General Rules for the Pronunciation of the German Language" as given in the old version of the book. Our readers will agree with us in deplored this when we mention, for instance, that *th* is described as "merely *t* lengthened," that *d* has "a sound at the beginning of words and syllables between the *d* of *do* and the *th* of *thee*," and that *tz* "should be pronounced like *t-tz*." Why the publishers should have pressed for the reprinting of such pernicious nonsense is completely past comprehension.

We have delayed our notice of this book somewhat in order to test it by actual use, and it has stood the test extremely well. If we jot down a few points that we have noticed, it is certainly in no spirit of captious criticism. We are sure that another edition will soon be required, and then some of our remarks may be found useful.

Die Angel: add "fishing rod" to meanings; *ausschoten* omitted; *Blüte* (for *Blute*) in headline, p. 117; *Damwild* omitted (occurs in E.-G. part); *Delta*, ditto; *Fahrstuhl*: add "wheel chair"; *Fassade* omitted (occurs in E.-G. part); s.v. *Feder*: add *sich mit fremden Federn schmücken*, *Federwisch*, *Federwolke* (occurs in E.-G. part); *Fessel* in headline, p. 197; s.v. *Fisch*: add *Fischkorb* (=creel); s.v. *Gift*: add *Giftpflanze*; s.v. *Haft*: add *Haftwurzel*; s.v. *Hand*: add *Handkoffer* (occurs in E.-G. part); s.v. *Hohl*: add *Hohlspatel* (occurs in E.-G. part); s.v. *Hopfen*: add *Hopfen-garten*, -feld (occur in E.-G. part); *kanalisiiren* omitted; s.v. *Kehle*, l. 4, *ist* for *ift*; *Kronleuchter*=chandelier, rather than lustre; s.v. *Mist*: add *Mistkäfer*; *Nachtfalter* omitted; *Noten-pult*, -ständere omitted; s.v. *Raupe*: add *Raupennest*; *Rettungsrakete* omitted; *Schah* omitted (occurs in E.-G. part); *Schildpatt*: read -platt; *Seemöve* omitted; *Skabiose* omitted (occurs in E.-G. part); *Staubfaden*=stamen; *Tiefebene* omitted; *Unkraut* vergeht or verdribt nicht; *Violoncell* = violoncello; *antennae* omitted; *beehive*: add *Bienenkorb* (occurs in G.-E. part); s.v. *bellow*: *röhren*; *coco-nut*, not *cocoa*; *daffodil*: add *Affodill* (occurs in G.-E. part); s.v. *garbage*, l. 3, read *zugestutzter*; *gasalier*: better -elier; *manger*: add "dog in the manger"; *pitapat* is not=ticktack; s.v. *poodle*: why "two —s, zwei Pudel"?; s.v. *rocket*: read *Rakete* (as in G.-E. part); s.v. *rose*: add "no rose without a thorn"; *signalman*: add *Bahnwärter*; *stratus* (cloud) omitted; *trowel*: add *Ausheber*.

Deutsche Gespräche. Von E. A. Meyer. iv+105 pp. (Leipzig: Reisland.) 1 m. 50.—Phoneticians will welcome this little book, which contains a number of idiomatic sentences with phonetic transcript on the opposite pages. The pronunciation represented is not *Bühnendeutsch*, but the conversational speech of an educated North German, uttered at a fairly quick rate. The book is therefore obviously unsuited for use with beginners, who speak rather slowly. This pronunciation uttered slowly would have almost a comic effect. For advanced pupils, on the other hand, and for the student of language, this record is valuable. There are some ingenious observations in the introductory pages, such as we have every reason to expect from the author of that excellent treatise, "Lautdauer im Englischen."

W. H. Riehl, Die vierzehn Nothelfer. Edited by J. F. L. Raschen. xii+79 pp. (Ginn.) 1s.—Riehl's amusing tale of the sixteenth century is not remarkably well presented in this edition. The biographical note gives the more important details of the author's life, but is written in very poor style. The notes contain such elegant Americanisms as "he became enthused, with jarring steps," and the exercises in composition such edifying sentences as: "The irresistible fellow before my scaffolding has truly misled me. After we have chatted a while, I will let your hand go. Carl says his mother is in the habit of calling him by his full name." The vocabulary is not complete.

Heine's Poems. Edited by C. E. Eggert. lxxix+233 pp. (Ginn.) 2s. 6d.—Taken together with Faust's edition of "Heine's Prose," this volume affords a very good idea of the poet's literary output. The introduction contains good material, but is spoilt by excessive wordiness and poverty of style; a sober-minded Englishman should have read the proofs. We have no patience with editors who pen such phrases as "he asked him at what he was then at work; disquieted by the non-appearance of the notification of the expected appointment"; or words like "care-free, national-patriotic, mattressvault." The discussion of the various books of verse should have been transferred to the notes, as this would have avoided much repetition. The selection is a good one, and if the editorial matter were reduced to half its present bulk and the style competently revised, the book would be quite welcome, especially as it is well printed.

Classics.

Plato's Menexenus. Edited by J. A. Shawyer. xxxii+24 pp. + text, unpage. (Clarendon Press.) 2s.—The "Menexenus" offers a difficult literary problem, which fits it to be the subject of an essay rather than a school edition. Did Plato think his formal speech good, or was he parodying anyone? There are objections to both hypotheses, and we are inclined to think that a third may be true—the speech may be really, as it pretends to be, a report. However, Mr. Shawyer thinks otherwise; and he gives his reasons in the preface. The boy who would read the notes to this book would hardly be able to appreciate the introduction. Why is Mr. Shawyer so very hard on the historical mistakes of the oration? He seems to hint that Plato was deliberately cooking history. But how could he have known all those details? There was no Cambridge Modern History in the fourth century before Christ. The rest of the introduction deals with rhetoric and rhetoricians, and contains much useful information. The notes are distinctly good, because they are few and to the point. On the whole, it is difficult to see for whom the book is meant; but one age of boyhood could use the notes with advantage, another might suck profit from the introduction.

A History of Greece from the time of Solon to 403 B.C. By George Grote. Condensed and edited, with Notes and Appendices, by Messrs. Mitchell and M. and B. Caspari. xxviii+812 pp. (Routledge.) 5s. net.—This is an attempt to collect those parts of Grote's History which have a permanent value. To this end, the Legendary Period, the Story of the Tyrants, the Fourth Century and Macedonian Period have been omitted, and other parts have been shortened. The specified omissions were made for the following reasons: "Grote was a rationalist; therefore because the science of comparative mythology has made giant strides since Grote's work appeared, the Legendary

Period has been omitted." Our knowledge of prehistoric Greece has been increased even yet more, which alone would make Grote's account of early times inadequate. "Secondly, Grote was an idealistic democrat, and was thus a prejudiced critic of the tyrants; therefore the chapters on the tyrants and those on the Macedonian Empire have been omitted." Here again much has been added to exact knowledge of these topics. The editors have, however, kept his account of the Athenian democracy, because "an author puts his best work into that subject in which his real interest lies." The early history of Sparta has also been omitted, together with much of his work on Greece other than Attica, on the colonies, on the great festivals, and on the Persian Empire. Political evolution is the main subject of the work. It must be admitted, however, that here Grote is as partial as in his account of the tyrants. In the parts retained, notes have been added referring to books which the reader will find useful. An introductory chapter has been prefixed, tracing the history of Athens before Solon. If we grant their premises, the editors have done their work well; but it is not easy to see for whom the book is intended. The serious student will not be content with only a part of Grote; even where he is mistaken his views must still be taken into account. The schoolboy or undergraduate, again, will want a more complete presentation of the history on modern lines. The politician, we fear, thinks himself wiser than to be taught by Grote or by Greece. But the volume is very cheap, and is well worth buying by those who do not possess the whole work.

Josephus, being the Autobiography and Selections from the Jewish War. Edited, with Introduction, by S. E. Winbolt. xxiv+248 pp. (Blackie.) 1s. 6d.—We offer a hearty welcome to this little book, which should be a very useful reader, to be taken in conjunction with history or scripture lessons. The translation is Whiston's, as revised by Dr. D. S. Margoliouth. A chronological table of Josephus's life is prefixed, another of the general history of the relations between Jews and Romans down to 71 A.D., and a tree of the Herods. Our only adverse criticism is that there should have been a full index.

Greek Lives from Plutarch. Newly translated by C. E. Byles. Theseus, Lycurgus, Aristides, Themistocles, Pericles, Alcibiades, Dion, Demosthenes, Alexander. viii+232 pp. (Arnold.)—We are glad to welcome any sign of interest in Plutarch, and especially any attempt to restore him to the schoolboy. These lives have been much shortened by omission of political digressions and other matters supposed not to be useful for the school. Allusions are explained in footnotes, where also quotations are added from English poetry; and the proper names, with very brief descriptions, are given in an index. The more difficult Greek names are accompanied by a transliteration which is meant to show how they are pronounced in current English speech; in order, as the editor says, to prevent the pronouncing of Pericles and Themistocles as rhyming with *clericals* and *cockles*. In the index, quantities are marked in an erratic way, only those syllables being marked which the editor thinks likely to be pronounced wrongly. (But why *Hērodotus*?) The translator's style is colourless, but also unpretending and free from affectation or infelicities. We think this is a book to recommend, although we do not agree with the editor that North would not have been better. We think it is desirable to restore the periodic sentence to English prose, and nothing can make up for the loss of the rich and vivid language of the older world.

The Epistles of Paul to the Colossians and Philemon. Edited by A. Lukyn Williams. With Introduction and Notes. Ixxiv+208 pp. (Cambridge University Press.) 3s.—Here are nine pages of text to 272 of commentary! But, in fact, commentaries on St. Paul's Epistles involve so many difficult and important questions, that they cannot be dealt with briefly. It is true, however, that there is a vast deal of repetition in these books, each of which seems to be written as though it were the only book in the world. What a waste it is, for example, to repeat all these descriptions of the MSS. and Versions! What we really need is a handbook or handbooks: one collection of notes on the language and interpretation of all the Epistles, divisible into parts; one or more on the topics of Church history, on the composition of the Epistles, their authorship, and their relation to each other. This edition seems to us to be full of learning and good sense, and to be a worthy companion to Mr. Bernard's edition of the *Pastorals*.

Easy Exercises in Continuous Latin Prose. By W. E. P. Pantin. xii+310 pp. (Macmillan.) 3s. 6d.—This is a reprint of Macmillan's Latin Course, part iii., and therefore needs no detailed criticism here. A brief syntax, clearly expressed, comes first; then the more important categories, each accompanied by exercises: sentences at first, leading up to continuous prose. An English-Latin vocabulary, tables of irregular verbs, and a section on numerals complete the work. Mr. Pantin is a practical teacher of experience, and the book is good of its kind; it would, however, take a rather long time to work through, and the subject-matter of the exercises is remote from the boy's experience. Sentences undoubtedly are useful, as helps, but they are very dull, and should not, in our opinion, be made the main vehicle for practice in Latin.

History.

The Story of Ancient Irish Civilisation. By P. W. Joyce. xiii+175 pp. (Longmans.) 1s. 6d. net.—There is so much that is being discovered nowadays as to the virtues and doings of what used to be called the "Celtic fringes" of these islands, and Dr. Joyce is such an authority on ancient Ireland (is he not President of the Royal Society of Antiquaries, Ireland, besides an M.R.I.A., &c.?) that we dare not venture to cast doubt on the truth of even the most glowing account that he gives us of the glories of the civilisation of Ireland in the ages when Anglo-Saxons were but ignorant heathens. Therefore, though, in the absence of the proofs which are in Dr. Joyce's larger books (of which this is but a summary), we do not feel entirely convinced, we can very heartily commend this book to all who would like to read for themselves and their pupils a delightful account of un-Anglicised Ireland, its monasteries and missionaries, its kings and its people, in that old-time Eden of the west.

Highways of History. Book I., 126 pp., 10d.; Book II., 173 pp., 1s.; Book III., 192 pp., 1s. 3d. (Nelson.)—These are readers, each covering the whole of Brito-English history, being written on the "concentric" plan, illustrated with coloured and other pictures, reproductions for the most part of pictures by famous artists. The letterpress is simple, and written mainly in connection with the pictures. In each book there are summaries of the lessons, and in the third some illustrative poetry. The idea is not so new or unique as the publishers seem to think, but the books are good of their kind. The stories are, of course, not scientifically accurate—legend is mingled with authentic

history—but they are well adapted, in the hands of a good teacher, to the little ones for whose use they are designed.

Notes of Lessons on English History. Book I., 55 B.C.—1603 A.D. 176 pp. (Pitman.) 3s.—This is a curious book. Its pages are divided into three columns, each about an inch and a half in breadth, and containing respectively "heads," "analyses of lessons," "teaching hints, &c.," the last consisting partly of what is implied in the title (e.g., "Bring this out clearly—a point very often overlooked"), partly of references to books, and cross-references. The last sixteen pages contain poems on English history, two by Drayton, the others of modern times. It might be useful for some teachers; others would be either amused or annoyed by its platitudes.

A School History of Lancashire. By W. E. Rhodes. xii+215 pp. (Methuen.) 1s. 6d.—This, like other books of the series, is well and plentifully illustrated with photographs, maps, and other presentations. The letterpress is clear and interesting. The author speaks of the geology, the earliest inhabitants, and everything connected with the county down to the present day. He wanders even into the story of earls and dukes of Lancaster, whether connected or not more than in a titular way with the county.

Geography.

- (1) *N. America.* By H. J. Mackinder. (Stanford.) 52 in. by 60 in.; mounted on rollers and varnished, 2os.
- (2) *England and Wales.* A *Simplex Wall Atlas of Five Sheets.* (Johnston.) 38 in. by 30 in.; metal bound and canvas backed, 15s.
- (3) *A Series of "Model Test Maps."* (Philip.) 28 in. by 34 in.; 17s. 6d. net.

No. 1 is the last issued of Stanford's well-known "new orographical" series, of which we have already reviewed Europe, Africa, Palestine, and Asia. We have nothing really to add to our summary of this series in the geographical portion of the article "Recent School Books and Apparatus" (v. THE SCHOOL WORLD, January, 1907). "Accurate and pleasing; well worth getting," we say now, as then. For the benefit of those teachers who may not know the maps, it may be well once more to point out the main features, viz., deepening tints of brown and blue for heights of land and depths of sea; grey lettering to keep the names in due subjection. We still think there are too many names for class purposes; why, for instance—except for sentimental reasons—should our antiquated friends Brown and Hooker still masquerade among the important peaks of Canada? With the map, as with its predecessors, the publishers issue a descriptive broadsheet of what to look for on the map, which is in itself an excellent epitome of the physical geography of the continent.

Nos. 2 and 3 are wall atlases ready prepared for hanging on the blackboard. "England and Wales," on a scale of twelve miles to the inch, comprises five maps showing the physical and political features, the railways and industries, and closes with a test map, which we think the best of the five. In the physical map, though the triangular divisions of river drainage are well indicated, we miss the coloured but simple contours which class teachers want; on the political sheet there are altogether too many names; the railway-map is inaccurate even for diagrammatic maps (e.g., Settle is shown on the wrong "fork" of the Midland, and Bradford is connected with Shipley by L. and Y., or G.C.R., instead of by the M.R.); while the industrial map is merely a collection of product names, plus the

coalfields, printed over a plain-tinted area of nothingness interspersed with rivers and railways.

No. 3 is a very pronounced set of somewhat crude maps enlarged from the "Model Atlas" published by the same firm. This particular set ("Set 2") includes Europe, Central Europe, Austria with Italy and the Balkans, Asia, India, Australia, S. Africa, and British N. America with U.S.A. The maps are photographic reliefs, printed in vivid blue and photographic purple. They are therefore very striking, but suffer from the obvious defect that they make everything appear too mountainous. The Great North Plain, for example, seems to have disappeared entirely from Europe, and its place is usurped by a most rugged and forbidding country. The river valleys are also enormously exaggerated. We calculate from careful measurements that the Tiber (on the map of Europe) is ten miles wide everywhere from source to mouth! Apart from this somewhat false impression produced, the maps would be useful in the hands of a good teacher. He could show with absolutely telling clearness how the rivers are the easiest highroads into or out of a country. But his pupils would need good school atlases for corrective purposes, especially as the "Model Test Maps" show neither scales nor latitude and longitude.

Mathematics.

Murray's School Arithmetic. By A. J. Pressland. viii+207+ (Answers) 40 pp. 2s. 6d., or without Answers 2s.

Supplementary Exercises to Murray's School Arithmetic. By A. J. Pressland. 84 pp. 6d.

This text-book is stated to be designed for pupils between the ages of ten and seventeen, and it furnishes ample material for the arithmetical training of such pupils. In several respects it differs from most of those in common use; the tables have been greatly simplified by the omission of the less important units; processes that depend on "peculiar commercial or social practices have been curtailed," and for good reasons, as we think; great attention is bestowed on such matters as approximations, checks, and rough estimates; special chapters contain applications to geometry, to commerce, and to physics, as well as to the connection between algebra and arithmetic. What is considered to be a novel feature is the inclusion of examples for discussion between teacher and pupil; whether the discussion of methods be a novelty or not, it is in any case a most valuable exercise, and the material is here ready to hand. The changes seem to us to be all in the right direction, and the book is a good piece of work that merits the careful consideration of teachers who wish, not so much a treatise on the principles of arithmetic, as a book that contains sensible examples arranged in a sensible manner. The Supplementary Exercises are drawn up on the lines of the text-book, but may be used independently of it.

Arithmetical Exercises for Junior Forms. By R. B. Morgan. Book II., viii+79+157+ (Answers) xxvii-xliv pp. (Black.) 1s.—Book I. was noticed in THE SCHOOL WORLD, vol. viii., 437. Book II. consists of four sections, which treat respectively of unitary method and decimals, factors and prime numbers, vulgar fractions, recurring decimals and decimalisation of money. The exercises give ample practice in the respective rules, and are usually of a sensible character. The explanations do not strike us as being specially useful; for the teacher they are rather out of place, while for the pupil they are often little more than a statement of the rule which he will probably have

obtained otherwise. There are, however, good elements in these explanations, and particularly the insistence on rough checks.

Pitman's "Method" Arithmetic. 324 pp., 3s. Answers, 67 pp., 2s. 6d. net.—The seven parts into which this text-book is divided have been noticed as they appeared (THE SCHOOL WORLD, vol. viii., 277, 398, 437; vol. ix., 114). While the questions are generally of a kind that the pupil can understand, they are too exclusively, we think, of a concrete character. Whether pupils like it or not, they should be drilled in purely mechanical operations; exercises for such drill might well be included in a book that goes to 324 pages. Many of the questions are first-rate; it is rather the absence of other kinds of questions that we regret.

Pitman's "Proficiency" Arithmetics. Part iii., 40 pp. paper 2d., cloth 3d. Part iv., 48 pp., paper 3d., cloth 4d. Answers to Part iii., 8 pp., cloth 3d. net. (Pitman.)—These books belong to the series noted on p. 194 of THE SCHOOL WORLD, and extend the work taken up in Parts i. and ii. The "concrete" character of the questions seems to us to be overdone.

Elementary Solid Geometry, including the Mensuration of the Simpler Solids. By W. H. Jackson. xii+159 pp. (Arnold.) 2s. 6d.—Solid geometry has probably not taken the place in school teaching that its importance demands; the meagre treatment given in that part of Euclid's eleventh book that was long the only readily accessible text-book is quite inadequate for the subject. It is greatly to be desired that fuller attention should be given to a side of geometry that is of very great importance for the mathematical student and that can be made of real value to the student whose leanings are not decidedly mathematical. In a comparatively short compass this text-book supplies all the leading theorems of solid geometry, arranged in an order that in several respects is better than that of Euclid, but furnished with demonstrations that are as rigorous as his. Interesting sections are included that treat of such subjects as the theory of perspective, of symmetrical figures, and Euler's theorems of polyhedra. The mensuration of the simpler solids is discussed with as great rigour as is probably desirable at the stage which the student will have reached. The concluding chapter, on the sphere, contains matter that is usually found only in works on spherical trigonometry. The book is provided with numerous excellent examples, and is altogether a thoroughly good piece of work.

A First Year's Course in Geometry and Physics. By Ernest Young. Parts i. and ii. viii+101 pp. (Bell.) 1s. 6d.—Part i. furnishes a combined course in geometry and physics, the physical element consisting in the carrying out by the pupil himself of the measurements that lead up to the geometrical properties of various figures. Part ii. contains a course of geometry. The book provides ample material for experimental work in geometry, but gives comparatively brief instructions for the use of mathematical instruments or for the performance of the exercises and experiments, leaving these to be supplied by the teacher. On p. 14 the statement is made: "If all your measurements had been made with great accuracy you would have obtained 3.14159 as the result of your calculations in Ex. 12." Is there any record of experiments that yield this value of π ?

Practical Mathematics. By John Perry. 183 pp. (Wyman.) 9d.—The six lectures delivered to working men in 1899, and published under the above title, have become

well known, and form by far the best source of information as to the author's views on the teaching of mathematics. It is useless to say more now than that in this edition many errors which had crept into the first issue have been eliminated, and that teachers, especially those who do not agree with the author, would do well to make themselves familiar with the contents of these lectures, and to study the exercises at the end of the book.

Mathematical Papers. Edited by E. J. Brooksmith. (Macmillan.) 6s.—This volume contains the mathematical papers for admission into the Royal Military Academy and the Royal Military College for the years 1897–1906. The collection is so well known to teachers and is so useful that it is sufficient to direct attention to its publication.

Science and Technology.

Observation Lessons in Plant Life. By F. H. Shoosmith. viii+179 pp. (Charles and Dible.) 3s. 6d.—This book provides excellent material for "object lessons" on common plants. Each lesson is illustrated by a page of sketches, white on black, which will give useful ideas for blackboard work. The book may be confidently recommended.

Nature Lore: June, 1906. By F. H. Shoosmith. 32 pp. (Charles and Dible.) 1d.—The attention of teachers may be directed to this little monthly reader. In town and country schools alike it ought to prove useful.

How to Study Geology. By Ernest Evans. viii+272 pp. (Sonnenschein.) 3s. 6d.—This book is based on the Stage I. Syllabus of the Board of Education, and will be found a trustworthy guide to that examination. For the most part the book covers the usual ground in the usual manner; it contains, however, a good description of field work in the Ingleborough district, as well as instructions for a number of useful practical exercises.

The School Journey. By J. H. Cowham. 79 pp. (Westminster School Depôt.) 1s. net.—The first half of the book consists of an account of a school journey from London to Godstone, annually taken by the students of the Westminster Training College. Following this are two additional journeys described by Messrs. G. G. Lewis and Thos. Crawshaw respectively. The descriptions are full of practical hints which teachers in any part of the country should be able to turn to good account.

Pedagogy.

"*A Primer of Psychology,*" by Miss Brackenbury (Murray, 1-120 pp., 1s.), very clear and very much specialised, shows on almost every page a resolution to have nothing to say to physiology. "As psychologists the physical series do not concern us." We wonder if in thirty years' time the psychologists will be so positive. The author in an interesting passage analyses the states of mind that go to the tying of a loose shoe-lace. Would the states have differed if a friend of the writer's had told her, falsely, that her hair was coming down? and how far would a real or imagined personal discomfort have been the motive cause of every single action? We teachers want psychology: but we are shortlived, and unless our books group the problems of the interchange of sensation, idea, and ethic (the visible body and its awful inheritance being before us all the time), we fear the school will profit little. One sentence of Aristotle, on habit burnt into the memory, will in the meantime

serve us well. The book is clear, its questions are suggestive, and it forms an admirable companion to others in this series.

"*The Secret of Herbart*" is, we take it, a Rationalist Press Association reprint (6d.). Dr. F. H. Hayward is known as an enthusiast, and, on non-ecclesiastic lines, he pleads eloquently for an apperceptive many-sided interest. "Satan finds some mischief still for idle hands to do"—this thought was known long before Herbart. But the examples of Alcibiades, Sir Francis Bacon, and Napoleon, who surely were all Herbartian, show that the secret may be learnt without its leading to the very moderate ethic possessed by the ordinary man. "The evil that I would not that I do." But the book is written *fervente calamo*: and teachers need all the enthusiasm they can pick up—from themselves or from any other quarter. They are invited by the Moral Instruction League (6, York Buildings, Adelphi) to peruse a new edition of a "Graded Syllabus of Moral and Civic Instruction." Everyone now knows the League and its objects; but so far, it seems, no country has definitely decided that virtue can be taught so as to issue in practical advantage without a definite attention being paid to the national standard of ethics. Even Japan builds on a fantastic creed. One may constantly find persons who can lecture on justice and hygiene, and yet by day and by night keep their windows shut. Behind our knowledge and even practice of the right, behind our good habits (formed, it may be, at school and forgotten outside), are these secret enemies of daemonic energy. Can the League discover and do battle with these?

Prof. Lloyd Morgan has rewritten his excellent "*Psychology for Teachers*" (E. Arnold, 1-306 pp., 4s. 6d.). Its greatest value is that it is not intended for examination purposes. It is full and lucid on the ways of thought. There is at the end a fine chapter on Character and Conduct, and the chapter on English Literature (which seems to have got by mistake into a psychologist's work) is an eloquent "aesthetic appeal." When will the teachers of any country learn from writers like this that we "live by admiration, faith, and love"? Surely it is rare to find an accredited psychologist quoting Watson's hymn—

" Trees in their blooming,
Tides in their flowing,
Stars in their circling
Tremble with song.
God on His throne is
Eldest of poets;
Unto His measures
Moveth the whole."

A book on "*Exposition in School,*" by T. C. Mitchell and G. R. Carpenter (The Macmillan Co., 1-372 pp., 3s.), treats of the advanced essay. It is as interesting as it is quaint. "How to put up the hair in a Psyche knot, how to prepare a clambake, how to become a good pitcher, stealing second base, Hazing's dark side and how to run a stationary engine" (these are essay subjects taken haphazard), would give some of us food for thought. The impression left by the book is that there is greater freedom in the choice of subjects and greater power in dealing with them in American schools. The advice is thorough and good. But "*Note-taking,*" by A. T. Robinson (Heath, 1-24 pp., 9d.), seems unnecessary. Examples are given of good and bad note-taking. Must not the student in this suit his own idiosyncrasies? And nothing is said of the useful practice of taking mental notes. It is quite

easy to teach students how, without pen or pencil, to remember a lecture and miss no salient point.

"Natural Elocution," by Hardy Flint (Blackie, 1-72 pp., 1s.), is a very sensible little book written by someone with experience. It is a plea for the expression of natural emotion. The phonetic transcript should be normalised, and the fact that the book is obviously written for Irish pupils might be hidden.

"Eyesight in Schools," by C. C. Caleb (W. Dawson, Fetter Lane, 1-80 pp., 1s.), is in every way an Indian production. The author, who writes from Lahore, is evidently well acquainted with the surgical and anatomical sides of his subject; yet he does not advocate, any more than we do in England, that the eyes should not be worked so hard. It is a far cry from Lahore to the country schools of the States ("Among Country Schools," by O. G. Kearn; Ginn, 1-366 pp., 5s.), for which in a very original book the author pleads very strongly. The questions raised do not affect us here, unless our farmers think of bestirring themselves: but anyone wishing to look at a type of school and a type of teaching absolutely new would be repaid by the text and the innumerable photographs. A startling table on p. 312 seems to say that one half of all the children entering the U.S. public schools have *one year's teaching only*, and then "drop out"; while bread-winning begins for the child at ten. Yet nearly all the books we are now considering come from America, about which great country and its child-labouring population one may read in Mr. Weil's "Future of America," pp. 149-164. Yet, untroubled by such things, educational books pour from the press.

"Principles of Secondary Education," a text-book, by C. de Garmo (Macmillan, 1-298 pp., 5s.), is, presumably, intended for students. There is admirable material for discussion, though, as in most American books, a good deal of the vocabulary is unintelligible to us. We wonder why none of these books touch on the time now wasted in learning subjects slowly. We have, for the study of earthly subjects, no eternity promised us. This book will reveal to the Englishman a view of secondary education with which he will be unfamiliar; a companion volume written on this side would be useful to us—and perhaps to America.

A threepenny pamphlet on the "Special Temptations of Early and School Life" is a reprint of a paper read at Ripon many years ago. Although Dr. C. G. Wheelhouse is the author, and knows the physiological side of the question, little use is made of his knowledge. It cannot be too often repeated that, in the opinion of many parents and schoolmasters, solitary vice will yield to physiological lessons in blunt language and to relentless medical inspection (when necessary) sooner than to the terrifying ideas put forward in the name of religion.

"A Plea for Recreation Evening Schools" (Social Questions of the Day, No. 4; J. Clarke, 1-64 pp., 6d.) points to the necessity of filling gaps in the educational ladder: a ladder that is let down from the roof and grows up from the ground and that is not finished midway is not much of a ladder. The real difficulty is that boys between fourteen and eighteen do not want to come to evening schools. Abroad, they are compelled to come: we, in England, fear compulsion, and thus we throw away with both hands the results of our primary schools.

"The Education Bill of 1906," by S. L. Porter (Macmillan, 1-38 pp., 6d.), is worth keeping on the shelf. The provisions agreed upon by both parties and the contested clauses are clearly stated.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Preliminary Education of Elementary School Teachers.

I HAVE read with interest the two articles contributed to the June number of THE SCHOOL WORLD upon the preliminary education of elementary-school teachers, written from the standpoints severally of the headmaster of a secondary school and of a master of method at a training college.

Without desiring to add very much to the discussion as to the desirability of the new bursary system from a restricted and purely educational point of view, or indeed to lay further stress upon the undoubted difficulties that beset the adoption of it as indicated in the above-mentioned papers, I should like to direct attention to what, in my opinion, is the supreme argument in favour of the bursary system, viz., that in matters of conduct and general bearing, no less than in disposition towards his studies, the lad from a good secondary school is more mature than the corresponding student four, or even five, years older from a pupil-teacher centre. An encyclopædic sweep over the whole range of the humanities and the wide domain of scientific studies, culminating in a pass B.A., B.Sc. graduation in one of our examining universities, is no longer the only ideal that commends itself to the youth in the highest forms of even the newer of our secondary schools.

If the local education authorities accept, then, the judgment of the secondary schools and training colleges in favour of the general idea underlying this new bursary scheme, viz., to secure for intending elementary-school teachers a continuous course of not less than four years at a secondary school, it becomes incumbent surely upon them to make the realisation of such a scheme as widely applicable as possible.

To educational authorities such questions quickly resolve themselves into a financial concern. There is a disposition, however, as may be seen from the reports of the recent meeting of the Education Committees' Association, to accept the Government's tempting offer, made in the 1906 training college regulations, for the extension of existing and the building of new training colleges. But is this desirable or necessary? The answer must depend largely upon the view taken of the relative importance of two very nearly allied problems which are a close concern of all educational authorities, viz.: (1) the provision of an adequate supply of trained teachers; (2) the improvement of the quality of their teachers. The question whether quality was to be sacrificed to quantity might fairly seem at first sight to be the issue between them. But a closer examination reveals that the two problems, so far from being mutually destructive, are capable of solution jointly by a single, so to speak, self-adjusting policy.

Let the educational authorities accept boldly the consequences of their acknowledgment of what is being urged upon them by the new regulations of the Board and by their own experts, viz., that the improvement in the facilities of reaching the secondary school is the paramount consideration in the problem of the preliminary education of elementary-school teachers, and let them accordingly devote all their available funds to the provision of scholarships and bursaries, and so give all intending teachers as long a continuous

course at a secondary school as possible before entering a training college. This done, the problem of increasing the supply of trained teachers would practically solve itself. For an increased supply of trained teachers does not necessitate costly new buildings, &c., but merely a modification of the present system.

It is a matter of common knowledge among educationists that the existing two years' course at the training colleges is largely necessitated by the burden that is laid upon them of making up for the shortcomings of the old pupil-teacher system. If, therefore, the pupils entered the training colleges better equipped on the academic side, as we may safely conclude that they would do, if they all entered as bursars, then the most cogent reason for the present two years' course would be removed. A one year's course would be devised, say of four terms, devoted almost entirely to professional work, the theory and practice of teaching.

The change would not be very greatly felt in the training colleges as regards the professional side of their work, which already not infrequently maps out as a one year's course.

Such a plan would command itself to the business mind of the member of an educational committee, because he would readily grasp that without any additional expenditure upon the training college, he would be obtaining exactly double the previous output of trained teachers each year.

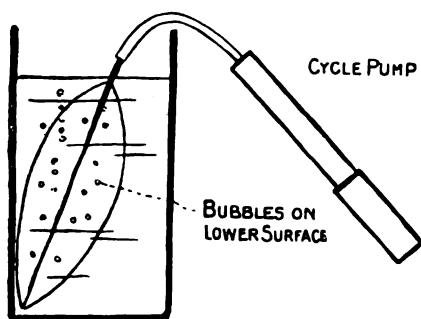
HARVEY WILLIAMS.

Normal College, Bangor.

Experiment to Show the Existence of Openings on Leaves.

In your last issue Mr. E. H. Davies described one method of demonstrating leaf-stomates; I should like to describe another demonstration, both simple and effective, which I have found useful, and which may be of use to teachers who have a limited supply of apparatus at their disposal.

A large leaf, a short piece of rubber tubing, a cycle pump, and a suitable vessel of water large enough to submerge the entire leaf are necessary. We find that a Ficus leaf (indiarubber plant) is suitable, and its large petiole can without difficulty be firmly fixed into one end of the rubber tubing, whilst to the other end of the tubing the cycle pump is attached (see Fig.). When the leaf



is submerged and the pump in action, a large number of bubbles arise from the *under surface* of the leaf and none from the upper surface. The bubbles arise from the stomates which are present on the under surface in this type of leaf.

From this experiment it is evident that the bubbles pass out through natural openings (stomates) in the leaf-skin, and there is no need for the assumption required

by Mr. Davies's experiment, that, because all the joints of the apparatus are air-tight, therefore the air must come through leaf-openings.

Another advantage of this method is that it shows the distribution of the leaf-stomates.

ERNEST E. UNWIN.

The University, Leeds.

Practical Examinations in Science.

In your June issue (p. 213) we read : "The committee recommends an oral examination in science, and it anticipates that this may some day replace the practical. Practical examinations in science are never satisfactory." We shall probably agree that there is an element of flukiness in practical examinations; that is certainly a reason for amending such examinations, but not necessarily for abolishing them. As to the value of practical examinations, there is *per contra* the "Programme of the City and Guilds Central Technical College" (p. 11) with the proposal : "It is probable that later on the written examination for *Pass* Candidates will be abolished, and that the practical pass examination will become obligatory for all candidates."

If we regard the power of learning from things by original investigation as one chief end of science teaching, then a properly devised practical examination would seem a most useful test.

To ask for crystals of zinc sulphate to be prepared from zinc and sulphuric acid is not such a bad question. It discriminates those who do not dilute the acid, those who do not allow enough zinc or enough time to neutralise the acid, and those who evaporate to dryness. But it is not easy to produce the crystals in less than an hour, and it would be unfair if this were the only question. An examination in arithmetic or history would be called fluky if there were only one or two, or at most three, questions.

The remedy for the practical examinations is either to allow more time or else to shorten the questions, but anyhow to increase the number of questions so that there may be *more separate chances of success or failure*, the accuracy of the total marks varying as the square root of the number of questions. If we spin a penny only twice we do not expect to get just one head and one tail; but when a class of boys are employed to spin pennies for a whole hour, and keep a record of results, the final totals are in very striking agreement with theory.

In a morning paper of three hours, followed by an afternoon paper of three hours, it would be possible to set six questions taking one hour each. But more accurate marks would perhaps be obtained by setting twelve short questions and allowing five minutes for each. Such questions might be :

- (1) Write a list of and add the weights on the balance pan.
- (2) Read the volume of air in the Hempel burette.
- (3) What is the temperature shown by the thermometer.
- (4) Draw the crystal.
- (5) Neutralise the litmus, &c.

It is extraordinary how beginners lose marks on these easy questions, which prove quite hard enough for marking purposes. Moreover, until good marks are obtained on such elementary questions, it is unnecessary to set more complex quantitative problems.

Another way of saving time in a practical examination is to relegate all calculations to the theoretical paper. Questions requiring some power of designing new combina-

tions of apparatus or planning new methods of experiment can also be dealt with on paper.

The proposal to use school notebooks as a basis for *viva voce* questions will, I hope, receive a fair trial.

HUGH RICHARDSON.

Bootham School, York.

The Pronunciation of Latin.

THREE months ago the Board of Education issued a circular dealing with the pronunciation of Latin in schools. With the first part of the circular it is impossible to find fault. There is to be a uniform pronunciation in each school; long vowels are to be pronounced long, and short vowels short. It is surprising that a rule so necessary to the appreciation of Latin poetry should ever be violated by schoolmasters. Perhaps now we shall in time get rid of the bugbears *lōcus*, *lōci*, and *minus*.

But the communication ends with a threat that in a short time a more sweeping reform will be introduced, and urges schoolmasters to begin to comply at once. The English pronunciation of Latin is to be abolished, and no teacher will be considered competent who does not pronounce in what some of us are tempted to call the "new-fangled philological" way. Latin *ā*=Eng. *a* in father, Latin *ē*=Eng. *a* in fate, Latin *c*=Eng. *k*, &c.

As this reform seems to us to be unconsciously prompted by an aesthetic desire to have Latin spoken as it was spoken 2,000 years ago, it would be well to begin by stating the obstacles to such a well-meant effort. It is impossible ever to acquire the exact pronunciation of a dead language. In the case of living languages, where rules of pronunciation have been compiled with almost perfect accuracy, we can never learn pronunciation without a living exponent; how much more so in a case where some of the elementary rules of pronunciation are still open to dispute. It is ridiculous to aim at the impossible. If Cicero or Virgil came into our class-rooms while we were pronouncing according to the *correct* (!) method we should be covered with confusion. But if we were less ambitious and made no pretensions to correctness, we could bid them defiance. That there is nothing to be gained in scholarship (the ability to write and understand Latin) is evidenced by many of our most famous scholars who pronounced in the old way.

But the claims of the modern or foreign pronunciation are said to rest on a philological basis. For it is impossible to understand the history of modern Italian words or of Latin words themselves (e.g., the connection between *claudio* and *clavis*) unless the sounds of Latin letters are given their philological value. Now the average boy for whom it is our special duty to provide will never be concerned with Italian or the history of Latin words. On the other hand, our common English words, the derivation and understanding of which is the main reason for learning Latin in the secondary school, are most easily derived, not from the modern, but from the English pronunciation. It is very doubtful whether the boy of average intelligence will recognise the connection between *civis* and *civic*, *invado* and *invade*, *natio* and *nation*, if the Latin words are pronounced *kewis*, *inwado*, *natio* (not *nashio*). And it is uncertain if anything is to be gained for the boy who will carry his classics on to the university. The philological values can be learnt in half an hour at the age of eighteen, but a new pronunciation is apt to discourage young boys.

Last, but not least, we must remember that boys study French or German as well as Latin. To accord to Latin

a foreign pronunciation is to class it with the modern languages, and nothing can be more fatal. The whole habit of mind involved in the study of Latin is at variance with that involved in the study of modern languages. The grammar and syntax, the structure of the sentence, the general form of thought are so complex, so different from our own, that the meaning of each sentence must be hammered out with mathematical precision. We know the disastrous results when boys make flying shots at the sense before they have arrived at the literal translation. In French or German there can be no objection to a fluent paraphrase, for the form of thought is the same as ours, and there are no dangerous pitfalls. It is in schools where the idea that Latin can be regarded as a spoken language is encouraged that we see the most striking examples of bad syntax, bad grammar, and bad paraphrase.

I have said nothing of the schoolmaster who must change his old methods for new. He is but a small item where great (?) reforms are concerned.

J. O'H. P.

A Warning.

WILL you allow me, through the medium of your paper, to direct the attention of heads of schools to a series of frauds that is being perpetrated?

A man, who states that he comes from Lahore, is calling at schools and endeavouring to obtain money from principals by means of stolen cheques, which he offers in advance payment of fees for two children for whose care and education he makes all arrangements.

He is of gentlemanly appearance and well educated. If he should call on any of your readers, they would be doing a service to the public by detaining him while they send for the police. This is the reason for my asking you to publish a warning letter.

E. LEADER.
(Lady Principal.)

Elmshurst, East Finchley.

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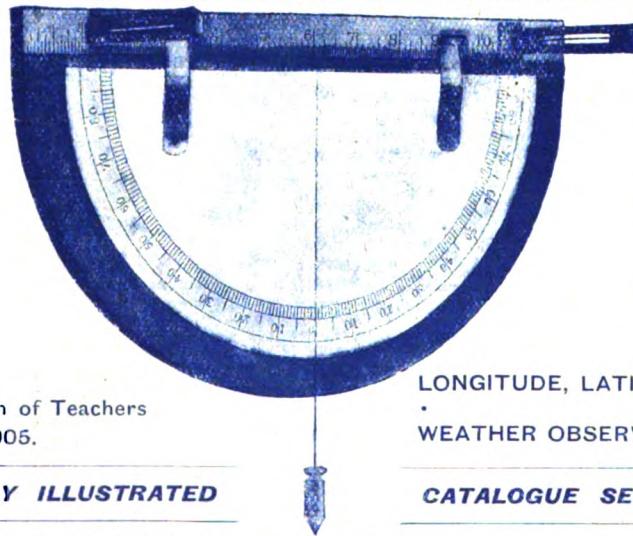
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The School World

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SIXPENCE.

THE NEW REGULATIONS FOR SECONDARY SCHOOLS.

M R. MCKENNA'S statement in Parliament a short time ago prepared us for important developments in the State organisation of secondary education. The regulations now issued fully bear out the Minister's forecast. The increased Treasury grant has enabled the Department to make drastic, not to say revolutionary changes, which cannot fail to have far-reaching results in the whole field of national education. A bold attempt has been made to co-ordinate primary and secondary education by allocating the increased grant to those schools only which are willing to offer a large proportion of "free places" to pupils from the elementary schools. At the same time the schools are set free from numerous harassing restrictions which unduly limited their freedom and made satisfactory internal organisation almost impossible. A summary of the regulations will show the sweeping character of the changes introduced.

In the first place, the schools are to be placed really and not nominally under the control of the local authorities, which are in future to appoint a majority of the governing body. No religious test is to be applied to members either of governing body or of staff. No denominational religious instruction is to be given—except on the written request of parents, which *may* be acceded to, although in that case the cost of the instruction given is not to fall on public funds.

These conditions will, in the case of nearly all the grammar schools of the country, involve fresh schemes or "instruments," and the replacement of existing governing bodies by representatives of the local authorities.

Much greater liberty will be given to a school in framing its curriculum and "special course" schools with higher grants disappear. It is especially worthy of note that encouragement in the form of an increased grant will be given to schools making special educational experiments approved by the Board.

Subject to reasonable restrictions, a school may draw up its own curriculum—it will no longer be necessary or possible to select "special

science" subjects in order to obtain a higher rate of grant.

The old grants with their vexatious complications and variations disappear, and are replaced by a uniform grant of £5, payable on all boys between twelve and eighteen. This will be calculated terminally, so that a school will get credit for all its work, and will not earn grant solely on those pupils who are accommodating enough to begin only in September and to leave only in July.

The grant will be paid for the full six years of the boy's school life, and no longer be limited to four years. It will be paid, too, no matter where the boy is placed in the school, provided that he is not evidently unfit to profit by the education given. It will no longer be necessary to keep bright boys back or to promote dullards in order that they may be in the proper "year" to earn grants. Boys between ten and twelve who have received their previous education in a primary school will be able to earn a grant of £2, sufficient to cover the loss caused to a local educational authority by their transfer to the secondary school. It is probably safe to say that an "ordinary course" school will receive double its previous grant; the "special course" school will not gain so much, but will suffer no loss; while special provision has been made for small schools by fixing a minimum total grant of £250—a great boon to the small and struggling country grammar school.

In internal freedom the gain is very great—the burden on the headmaster or headmistress will be enormously lightened, and the efficiency of the schools appreciably increased. But there is a *quid pro quo*, and the generous grants have to be paid for. The condition which will excite the greatest interest, and no doubt cause much searching of heart, is the "free place" stipulation. Twenty-five per cent. of the school places must be offered free to pupils who have for two years immediately preceding been in attendance at public elementary schools. The regulations have been supplemented by peremptory directions for the immediate fulfilment of this condition. "Free places," equal in number to one-fourth of the total number of pupils entered during 1906-7, are to be offered next September. Candidates

under ten and over fourteen may be refused; so far as possible they should be under twelve years of age.

An examination is to be conducted by the governing body, which is to be qualifying and not competitive unless the number of applicants is greater than the number of "free places." Candidates are to be reported on by their elementary-school teachers; and in the examination itself it is suggested that the aid of persons of experience in elementary schools would be advisable.

The subjects of examination are to be limited to English and arithmetic, at all events in the case of young candidates. Pupils from elementary schools who are entering the school with scholarships will be counted as "free place" holders. Thus a school of 200 pupils, which admitted 48 new pupils in the course of 1906-7, must in September next offer 12 free places, but is entitled to subtract from the 12 any scholarship holders who received their previous education in public elementary schools.

Will schools or local authorities accept the new conditions? If not, the grant will be reduced to £2 10s., and this will mean that the total grant earned will be about equal in amount to their former grant. There is little doubt, however, that the Board intends to press for the full execution of its scheme. Liberty of refusal is limited to one year only—next year no option may be given. If the conditions are then made compulsory, it is plain that the type of secondary school which will survive is the municipal secondary school with a low fee, or perhaps, as the Board seems to suggest, with no fee at all.

It is a pity that so little time for consideration has been given to the local authorities. Their responsibility has been greatly increased, while their hands have been forced by the very explicit directions as to the method in which the free places are to be awarded. Many local authorities have an excellent system of county scholarships, and an extension of this system might have satisfied all the requirements of the Board. As it is, those local authorities which have awarded sufficient scholarships to fill the required number of free places will not be affected, while those which award a smaller number must apparently adopt a dual system. It is to be hoped that the views of county authorities will be ascertained and due weight given to them before a rigid system is adopted.

To sum up: the scheme is a courageous attempt to provide secondary education for the people. It has been hailed in some quarters as though it heralded an educational millennium. The secondary-school teacher will work whole-heartedly to make it a success. But its success or failure depends on the people themselves. They must make sacrifices to keep their children at school. The English parent has an opportunity now which he has never had before. Will he show himself the equal of the Welshman or the Scot?

SOME USEFUL ARITHMETICAL DEVICES.

By G. H. BRYAN, F.R.S.
Professor of Mathematics, University College of North Wales.

IN turning over a number of old papers some time ago, I came across a note on a "Simple rule for squaring any number," which I sent to *Knowledge* for publication and thought nothing more about it. From the correspondence which ensued it was evident that the method, though possibly as old as the hills (it is given in E. M. Langley's excellent book on "Computation"), was not without interest to those who read the note. The present article is intended to direct attention to this and other arithmetical devices of a similar kind. It is not claimed that these devices are new, though the method for calculating the hypotenuse of a right-angled triangle is not based on any previous work which has attracted my notice, and is the most useful dodge I have come across for a long time.

RULE FOR SQUARING A NUMBER.—This is the exact inverse of the process commonly used for finding a square root. It is perhaps remarkable that while every boy learns to extract square roots by the ordinary rule, hardly anyone learns to perform the inverse operation by merely reversing the steps, although the latter method really affords the simplest proof of the rule for the square root.

If we find the square of $a+b+c+d$, the result may be written :

$$a^2 + (2a+b)b + (2a+2b+c)c + (2a+2b+2c+d)d.$$

Accordingly we first multiply a by a , then we multiply $2a+b$ by b , then multiply $2a+2b+c$ by c , and so on.

To find the square, for example, of 237·21, the process will stand as follows :

$$\begin{array}{r} 2 \ 3 \ 7 \cdot 2 \ 1 \times 2 \ 3 \ 7 \cdot 2 \ 1 \\ \quad \quad \quad \times 2 \quad \quad \quad = 4 \ 0 \ 0 \\ 4 \ 3 \quad \quad \quad \times \ 3 \quad \quad \quad = 1 \ 2 \ 9 \ 0 \ 0 \\ 4 \ 6 \ 7 \quad \quad \quad \times \ 7 \quad \quad \quad = 3 \ 2 \ 6 \ 9 \ 0 \ 0 \\ 4 \ 7 \ 4 \ 2 \quad \quad \quad \times \ 2 \quad \quad \quad = 9 \ 4 \ 8 \ 4 \ 0 \ 0 \\ 4 \ 7 \ 4 \ 4 \ 1 \quad \quad \quad \times \ 1 \quad \quad \quad = 4 \ 7 \ 4 \ 4 \ 1 \\ \hline & & & & 5 \ 6 \ 2 \ 6 \ 8 \ 5 \ 8 \ 4 \ 1 \end{array}$$

The figures in the units' place are printed in thick type, and indicate the position of the decimal point. In each line two o's are added to show where the next line below should commence. It is evident that the method, though worked out to the bitter end in the above example, can be contracted.

We may compare this process with the inverse process of calculating the square root of 56268·5841, and we write the division out in full to make the comparison clearer.

$$\begin{array}{r} 2 \ 1 \ 5 \ 6 \ 2 \ 6 \ 8 \cdot 5 \ 8 \ 4 \ 1 (2 \ 3 \ 7 \cdot 2 \ 1 \\ \quad \quad \quad \downarrow \\ 4 \ 3 \ 1 \ 6 \ 2 \\ \quad \quad \quad \downarrow \ 1 \ 2 \ 9 \\ 4 \ 6 \ 7 \ 3 \ 3 \ 6 \ 8 \\ \quad \quad \quad \downarrow \ 3 \ 2 \ 6 \ 9 \\ 4 \ 7 \ 4 \ 2 \ 9 \ 9 \ 5 \ 8 \\ \quad \quad \quad \downarrow \ 9 \ 4 \ 8 \ 4 \\ 4 \ 7 \ 4 \ 4 \ 1 \ 4 \ 7 \ 4 \ 4 \ 1 \\ \quad \quad \quad \downarrow \ 4 \ 7 \ 4 \ 4 \ 1 \end{array}$$

It will be noted that we subtract in turn the products 2×2 , 43×3 , 467×7 , 4742×2 , 47441×1 from the number whose square root is required, leaving a remainder zero. The number $56268\cdot5841$ is thus shown to be equal to the square of $237\cdot21$ obtained by the above rule.

CALCULATION OF THE HYPOTENUSE OF A RIGHT-ANGLED TRIANGLE, AND ALLIED PROBLEMS.—It is often required to calculate expressions of the form $\sqrt{(a^2 + b^2)}$, or more generally $\sqrt{(a^2 + x)}$, where the second term is small in comparison with the first.

Let us start with an example in which the method is the simplest possible; say we have to calculate $\sqrt{(270)^2 + (36)^2}$, that is, $\sqrt{(270)^2 + 1296}$. If we take 270 as giving the first two significant figures of the required result, then 1296 is the remainder when the square root has been calculated so far. We merely have to continue the process of extracting the square root from this stage, and the work stands as follows, taking 54 for the trial divisor :

542	1296	(272·3894)
	1084	
5443	212·00	
	163·29	(Contracted method follows)
5446	48·71	
	43·57	
545	5·14	
	4·91	
55	0·23	
	0·22	

This example is a comparatively easy one, as the significant figures of the term a are identical with the first significant figures of the required value of $\sqrt{(a^2 + x)}$. This, however, is not the case in a great many problems that present themselves. As an instance, suppose it is required to calculate $\sqrt{(2732^2 + 189564)}$.

Here if we take 2732 as part of the root, the trial divisor 5464 will go into 189564 over 30 times, so that the third and fourth figure of the value 2732 originally selected for the square root will require alteration. What we shall do in this case is to add the results of the successive divisions to the number 2732 and the corresponding trial divisor, and the work will stand as follows :

(1st trial divisor)	5464	189564	2732 (assumed square root)
(Corrected divisor)	5494	16482	30 (1st quotient)
(2nd trial divisor)	5524	24744	2762
(Corrected divisor)	5528	22112	4 (2nd quotient)
(3rd trial divisor)	55324	2632 (2766·4 (ord. method begins))	
		221296	
(Contracted method)	55328	41904 (7574 by contracted division)	
		38730	
	5333	3174	
		2767	
	553	407	
		387	
	55	20	nearly.

Thus the final answer is 2766·47574, taken to a great many more significant figures than would usually be required.

Explanation of the Method.—The first trial divisor 2732×2 or 5464 goes 30 times into 189564; we must therefore add 30 to the assumed square root, making it 2762, and add 30 to the divisor, making it 5494. Multiplying the corrected divisor by 30 and subtracting, we obtain 24744 as the remainder, when the square root is taken to be 2762, and the corresponding trial divisor is 5524. This goes 4 times into 24744; we therefore add 4 to the square root and 4 to the second trial divisor, so that the corrected square root is 2766 and the corrected divisor is 5528. Multiplying 5528 by 4 and subtracting, the remainder is 2632, and the third trial divisor is 5532. At this stage the ordinary method of finding the square root becomes applicable, and at the next stage we have finished the calculations to five decimal places by contracted methods.

The following application to the case of $\sqrt{(596^2 + 29741)}$ shows that even in the extreme case where all the figures except the first have to be recalculated and the first figure is itself changed by carrying, the method is shorter than the ordinary direct method of calculation. The remainders are alone given, and the work somewhat differently arranged.

Trial Div.	Corr. Div.	Remainder	Sq. root
1192	1212	29741	596 + 20
1232	1236	5501	616 + 4
1240	12404	55700	620·44, &c,
	12408	6084	
	

Among the numerous applications to which the method could be put are the following :

(1) To find the length of a line measured up the side of a hill, having given the height of the hill and the projection of the line on a horizontal plane.

(2) To find the resultant when a small force is applied at right angles to a larger one.

(3) Calculation of the roots of a quadratic equation in finding $\sqrt{(b^2 - 4ac)}$, when $4ac$ is negative and smaller than b^2 . (See also next case below, when $4ac$ is positive.)

(4) To find the third side of a triangle, given two sides and the included angle, when one side b is very much smaller than the other. In this case we have $c = \sqrt{(a - b \cos C)^2 + b^2 \sin^2 C}$, which may be solved by taking $a - b \cos C$ as the first estimate of the square root and $b^2 \sin^2 C$ as the remainder.

(5) When a string connects two points in the same horizontal line, to find how much the string is lengthened when the middle point is pulled down a given vertical distance.

EXPRESSIONS OF THE FORM $\sqrt{(a^2 - b^2)}$ or $\sqrt{(a^2 - x)}$ can be calculated by the same rule with suitable modifications, especially when the first term is a good deal larger than the second. In this case, taking a as the first approximation to the square root, the first remainder $-b^2$ or $-x$ is negative. The first quotient is negative, and should be taken to be the smallest number which will convert the remainder into a positive one. After this the methods of the last section apply.

As an example take $\sqrt{(365^2 - 4000)}$.

$$\begin{array}{l} \text{1st trial div. } 730 \quad | -4000 \quad 365 \\ \quad \quad 724 \quad | -4344 \quad -6 \text{ (1st quotient)} \\ \text{2nd trial div. } 718 \quad | +34400 \quad 359 \quad 4788 \\ \quad \quad 7188 \quad | \quad 5604 \\ \quad \quad 719 \quad | \quad 632 \\ \quad \quad 72 \quad | \quad 57 \end{array}$$

HINDOO LONG MULTIPLICATION is not so well known in this country as it ought to be. It is mentioned, among other places, in Florian Cajori's "History of Mathematics," 1894 edition, p. 91. As an example take 12345×6789 .

Multiplicand						Multiplier
1	2	3	4	5	6	
6	2	8	4	0	6	
1	2	2	3	3	7	
7	4	1	8	5	8	
8	6	4	2	0	9	
9	8	7	6	5	5	
8	3	8	1	0	5	(Product)

It will be seen that the products of the figures of the multiplicand and multiplier are written down in the corresponding squares, the tens figure above and the units figure below the diagonal, and the results are added up along the diagonals, giving the final answer. This plan has several advantages :

(1) There is no carrying except in the last addition; consequently a slip in the work is easily detected, and moreover the multiplication can be performed far more quickly than in the ordinary method.

(2) The multiplications can be performed in any order whatever.

(3) If we wish to carry the multiplication, say, to five significant figures only, we stop at the squares running down the corresponding diagonal. If for any reason we subsequently find it necessary to calculate the product, say, to two more significant figures we only have to fill in the squares down two more diagonals, and add up the corresponding figures without disturbing the previous work.

(4) The position of the units' place in multiplying decimals is easily assigned. For instance, let the above operation represent the multiplication of 12345×6789 . The units' place is determined by the lower figure in the square representing the multiplication of the 3 and the 7; this corresponds to digit 1 of the product, and the answer is 8381.0205.

MULTIPLICATION AT SIGHT.—This method is perhaps rather better known, but still not so well known as it might be. It was shown me some years back by Mr. J. D. Hamilton Dickson, of Cambridge, and I believe was published in *Nature* by someone else.

Suppose we have to multiply 246 by 135, we mentally perform the following process:

$$\begin{array}{llll} \text{Units' place} & 5 \times 6 & = 30 & \text{0 carry 3} \\ \text{Tens 3} & \text{carried} + 5 \times 4 + 3 \times 6 & = 41, & \text{1 carry 4} \\ \text{Hundreds 4} & \text{carried} + 5 \times 2 + 3 \times 4 + 1 \times 6 & = 32, & \text{2 carry 3} \\ \text{Thousands 3} & \text{carried} + 3 \times 2 + 1 \times 4 & = 13, & \text{3 carry 1} \\ \text{Fourth fig. 1} & \text{carried} + 1 \times 2 & = 3 & \\ \text{Answer } 33210. & & & \end{array}$$

To verify the method we need only consider it as a case of the multiplication of $2x^2 + 4x + 6$ by $1x^2 + 3x + 5$, where $x = 10$. In this case we have:

$$\begin{array}{llll} \text{Constant term} & 5 \times 6 & = 30 & \\ \text{Coefficient of } x & 5 \times 4 + 6 \times 3 & = 38 & \\ \text{,} & x^2 = 5 \times 2 + 3 \times 4 + 1 \times 6 & = 28 & \\ \text{,} & x^3 = 3 \times 2 + 1 \times 4 & = 10 & \\ \text{,} & x^4 = 1 \times 2 & = 2 & \end{array}$$

A good many years ago one or more men used to give public exhibitions, in which they would write down the product of two numbers with lightning rapidity, and the above method shows "the trick" by which this could be done.

The method is particularly useful in writing down products of numbers of two figures; e.g., 23×37 . Thus :

$$\begin{array}{r} 7 \times 3 = 21, \text{ 1 carry 2} \\ 2 + 14 + 9 = 25, \text{ 5 carry 2} \\ 2 + 6 = 8 \end{array}$$

the figures 851 being written down, beginning from the right as the successive steps are performed. For numbers of more than two figures the rule could probably be worked more easily by reversing the digits of one of the factors. This is a matter which any reader can easily work out for himself, personally. I do not much like reversing the digits in multiplication in any circumstances.

REDUCTION OF A FRACTION TO ITS LOWEST TERMS.—Exercises involving long and cumbersome fractions which can only be reduced to their lowest terms by finding the G.C.M. of numerator and denominator by the long rule are happily becoming less frequent in school courses than they used to be. If, however, the long rule is used, it is not necessary to divide the numerator and denominator by the G.C.M. in order to simplify the fraction. The quotients enable the fraction to be written down at once as a continued fraction. At this stage some reader may say, "Preserve us from teaching schoolboys continued fractions." I quite agree with him, but the exercises on the present method described in the next section appear to be instructive, and it is not necessary to teach continued fractions in the present connection.

Take, for example, the fraction $627/2679$. The process of finding the G.C.M. stands as follows:

$$\begin{array}{r} 627) 2679 (4 \\ 171) 627 (3 \\ 114) 171 (1 \\ 57) 114 (2 \end{array}$$

The G.C.M. is 57, and the successive quotients are 4, 3, 1, 2. If we were to attempt to work backwards, we should reproduce the figures of the above sum in reverse order by taking the follow-

ing series of operations, starting with 57 in the second column.

Quotients in reverse order	[Operation performed]
2	57
1	114
3	171
4	627
	2679
	[2×57] [$1 \times 114 + 57$] [$3 \times 171 + 114$] [$4 \times 627 + 171$]

Here it will be seen that we multiply each number by the quotient which we have written on the left of it, and add the number immediately above it. The last two numbers are those of which we started to find the G.C.M., i.e., the numerator and denominator of the given fraction.

Now suppose that instead of starting the second column with 57 we start it with unity. Then every successive number obtained will be to the corresponding number in the above calculation as 1 is to 57, and the two last numbers will be the numerator and denominator of the fraction expressed in its lowest terms. The operation now stands as follows :

Quotients	
2	1
1	2
3	3
4	11
	47

and the last figures, 47 and 11, represent the denominator and numerator of the fraction in its lowest terms. Since the given fraction is a proper fraction, the smaller number 11 represents the numerator and 47 the denominator, answer $11/47$.

To exemplify the practical working let us take another example, $1196/161$.

If we find the G.C.M. of 1196 and 161 the successive quotients are 7, 2, 3, and the G.C.M., which we do not require, is 23. The process is as follows :

Quotients	3	1
2	3	
7	7	
		52

and since the fraction is greater than unity the answer is $52/7$; or, stopping at the next stage below the lowest quotient, 7 gives the integral part and the preceding two numbers the fractional part; the answer as a mixed number is $7\frac{5}{7}$.

Personally, I should prefer to write down the quotients in the order in which they actually occur, and then work upwards, starting with unity at the bottom. The difference is, however, of no importance as regards the method.

MEASUREMENT OF THE RATIO OF TWO LENGTHS.—Now I do not advocate giving boys uninteresting drudgery in calculating greatest common measures or simplifying nasty fractions. But the above method taken in conjunction with an application which was suggested to me many years ago by Dr. W. Nichols, of Cambridge, may be made the subject of valuable practical training in exact measurement which would form an excellent exercise for the ordinary schoolboy, requiring no instruments whatever. Suppose that he is given two strips of paper or card or rulers of unequal

length, which we will call A and B , A being the greater, and he is required to find the ratio of their lengths.

He measures off the length B on A , and finds it will go a certain number of times, say once, leaving a remainder C . He writes down 1, and then measures off lengths equal to C on B , finding that C will go, say, twice, leaving a remainder D . He writes down 2, and then finds in the same way D will go twice into C , leaving a remainder E , and so on. After a certain stage the remainder will have got too small to measure, and we will suppose that at this stage the numbers written down (which are the quotients of the last section) were 1, 2, 2, 1, 1.

The calculation stands as follows, and the ratio of the two lengths is $17/12$.

1
1
2
2
5
1
12
17

Suppose, however, that the boy had made his measurements more carefully, and obtained a further figure, say 10, the result would have been $180/127$.

The numbers chosen in this example represent those which ought to be obtained in finding the ratio of the diagonal to the side of a square.

When a measurement has been made in this way, the pupil may measure the lengths of the two lines on a scale of millimetres, and may test the accuracy of his work by reducing the fractions calculated by both methods to the form of decimals, and thus comparing them. A more simple and instructive exercise in measurement it would be difficult to imagine; moreover, it affords an easy test of the relative skill of different boys in making the same measurements.

Since writing the above, I see that there is no necessity to introduce any difficult or advanced ideas in teaching a beginner the method. He only has to call the smallest length he reaches unity, and he can at once see what the other lengths will represent if he reads off the marks which he has made on the actual strips or rules themselves. Taking the second case, where the successive quotients written down were 10, 1, 1, 2, 2, 1, and calling the smallest length G unity, he will at once find for the other lengths $F=10$, $E=11$, $D=21$, $C=53$, $B=127$, and $A=180$.

How to Speak Effectively. By Charles Seymour. Second edition, revised and enlarged. 1-348 pp. (Routledge.) 3s. net.—This book, which has received marked approval from the Press, is a collection of rules and illustrations. The rules are useful, and probably a good deal may be gained from them: the illustrative pieces are well chosen and generally unhackneyed. It is a pity that, as the notices say, "clergymen, politicians, and all who have to use their voices in public do not study this subject of clear and good speaking"; but so long as they do not, so long Mr. Seymour's book and kindred books will be published to help them.

THE EQUIPMENT OF GEOGRAPHICAL • LABORATORIES.

By A. E. L. HUDSON, B.A. (Oxon.),
The County School, Pontypridd.

I.

WRITERS on geography have for so long spoken of their subject as being a practical science that teachers are becoming accustomed to the idea; headmasters are advertising for teachers who can apply the newer methods; and there are signs that education authorities are feeling less shy of the expenditure necessary to provide proper facilities for teaching geography. It seems opportune, therefore, to consider what form the provision should take; and it may be useful for those who have to make requisition for equipment to form an idea beforehand of the demands they may reasonably make.

It may be said at once that laboratory accommodation and equipment will be needed similar in extent to those provided for the teaching of physics or chemistry; in the case of geography, however, the initial outlay will be greater in proportion, the cost of "consumables" being relatively small.

Schools built in positions commanding a wide view have a great advantage; for them it will be possible either to provide a room with a clear outlook, preferably to the south, the east, and the west, or else to take pupils quickly to a suitable view-point. Even in town schools it should be possible to find a position from which the mid-day sun can be observed, and the latitude and longitude of which can be precisely determined.

A room suitable for classes of thirty scholars would be one about fifty feet long by twenty broad, having a flat roof, a balcony, or a terrace on which the class could assemble for part of the outdoor work. Such a room may seem unnecessarily large, but it should be remembered that, for any work beyond mere reading and writing, ordinary desk-room for the number of pupils in the class is quite inadequate. A laboratory is required, i.e., a work-room where things are to be made and exhibited; and since maps and much of the apparatus used are bulky, and pupils have sometimes to work together in groups, the pro-

vision of space must be generous. With regard to its height (it is not in these days necessary to insist on proper lighting and ventilation), there is plenty of space on the walls of a modern classroom for showing maps and pictures—and maps and pictures which are not constantly exhibited are doing only half their work.

A demonstration desk (Fig. 1) fitted with gas, water, and waste pipes, at least one large blackboard, and plenty of shelf and cupboard room, are obviously necessary.

• Whatever be the type of the desk adopted for the use of the pupils, it should possess a sloping surface of large size for drawing, and a horizontal surface for experiments and model-making, and be quite rigid. These requirements are well fulfilled by the "mechanical drawing-desk" of the kind shown in Fig. 2. Each pupil requires a drawing-board, which may be 28 in. by 19 in., this size being large enough to take a sheet of the Ordnance Map and a notebook at the same time. These desks can easily be fitted with a gas supply, and there should be in the room three or four sinks, with water-taps fitted sufficiently high to allow a "Winchester" to be filled at them.

For model-making a well-equipped wood-work bench is required (unless the school workshop is available), as

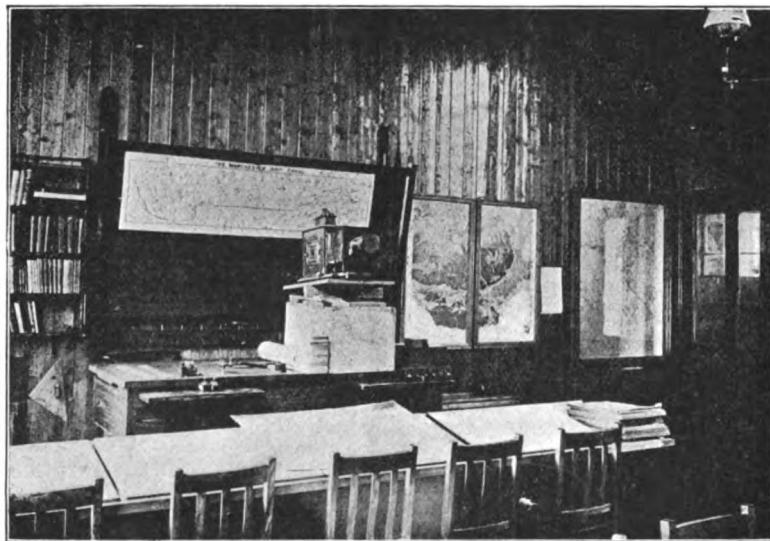


FIG. 1.

also are sets of certain tools to go round the class. It is suggested that each pupil should make, or take part in making, at least one model a year, to represent, say, either land-forms or astronomical movements. The best of these models will in time furnish the school with a complete illustrative series. The methods to be adopted will be discussed in a later article.

Pictorial illustration requires special provision. An optical lantern permanently mounted, and available for use at any time in a few minutes; opaque blinds running in grooves and completely darkening the windows when required; a large collection of slides, either bought, or hired, or made in the school, will all be wanted. It is the best, if it is possible, to make one's own slides: bought slides are expensive; so are hired ones if they are to be kept for exhibition to several classes; home-made ones are much cheaper, can be made from the illustrations in books and maga-

zines, and, most important of all, can be chosen to suit the work of the class and the methods of the teacher. Many lanterns are so made as to be available for both projection and enlarging; the latter method is especially valuable when a negative is obtained of some specially striking natural feature or some phenomenon of permanent interest, a picture of which may be worth framing and hanging on the wall. A modestly equipped dark-room would also serve the school Photographic Society. It should contain a copying apparatus for slide-making, either Barr and Stroud's or a simpler form.

A museum of natural products, and of articles and processes of commerce and industry, is a necessity, and is not expensive to fit up and supply



FIG. 2.

with specimens. The form of exhibition case adopted is a matter of considerable importance. Except for a collection of miscellaneous oddities, the best form is *not* that of a glass-fronted cupboard some twelve to eighteen inches deep from back to front. Vertical cases should be four or at most six inches deep, and should not be within two and a half feet of the floor, or reach much more than five feet above it. There are few objects really useful in teaching geography that will not find room in such cases; and it has been well suggested that any which do not fall into the series arranged by the teacher, but yet cannot be refused without offending some well-meaning giver, should be relegated to a special case labelled "Recent Additions and Donations."

Wall-space is wasted on museum-cases, which, besides, are rarely well lighted when hung against a wall; they are best arranged in pairs, back to back, near and at right angles to a wall with plenty of windows. A good plan is to have them standing on a case of shallow drawers, the top of which is glazed, so that the contents of the top-drawer are always exhibited; the drawers are all of equal depth, so that any one can be put into the top space. Museum cases and drawers should be painted white inside, and should be dust-proof. Objects which can be arranged in short series (e.g., examples of rock-denudation, cotton-spinning, or glass-making) should be grouped, each series in its own drawer, so that they can be taken out in a moment for class use.

Ordnance maps on all scales are necessary; those of the school district on the 25 in., 6 in., 1 in. (coloured), 1 in. (geological), $\frac{1}{2}$ in., and $\frac{1}{4}$ in. scales should be framed and exhibited permanently on the walls. Also there should be a stock of the 1 in. and 6 in. sheets showing the position of the school, for the use of the pupils in class. Editions of 200 copies and over, specially printed, are to be had at cheap rates from the Ordnance Survey Office at Southampton. One set of each of these should be folded for pocket use on class excursions.

Frames with movable backs secured by turn-buttons are useful for exhibiting pictures, of which a teacher of geography can nowadays easily make a large collection. Relief models of the British Isles, of the continents, and of at least a glacier and a volcano should be exhibited—and as many others as the authorities can be induced to provide.

For map-making, beginning with the school premises and neighbourhood, and working outwards on maps of a gradually increasing content, until some notion of astronomical measurement is obtained, sets of surveying instruments—such as land-chains, tapes, plane-tables, and sextants, and also a theodolite—are required. Many of these may be obtained in simple forms, specially made for educational purposes; but at least one accurate example of each should be available.

Meteorological instruments will, of course, be needed for the observation of the weather which goes to make up the climate. The lowest forms may well make a daily record of temperatures, and average it at the end of each month; while senior forms should keep a complete record, including the standard corrections, and work out the progress of atmospheric disturbances by combining their own observations with the daily weather reports. For this purpose they will require at least the school form of Fortin's barometer, with a set of thermometers and a rain-gauge. The chief difficulty in making such observations of real value consists in their interruption by holidays. Sometimes, however, an intelligent caretaker may be entrusted with the task of keeping up the series.

Since the mineral structure and resources of a region have so profound an effect on its geography, it will be necessary to provide for some simple work of a geological nature. A set of mineral

specimens, rock specimens, and common fossils will find its place in the museum; a set of reagents for the identification of minerals and a microscope with polariscope fittings for their determination; simple chemical apparatus for the examination of soils and natural waters, and for investigating the action of ice, rain, &c., on the land; all these are necessary if the pupils are really to observe for themselves instead of reading about the observations of others.

Wall-maps of the British Islands and their parts, the continents and the principal countries, and at least two globes, one physically coloured and one with a slate or blackboard surface, are a matter of course. There should also be a celestial globe, and some form of model for giving concrete ideas as to the effect of the earth's motions in producing day and night and the seasons.

These requirements involve considerable expenditure, but it will have to be faced if the work is to be done efficiently; and if the educators of the country are to be freed from the reproach of including in their curricula a subject which trains only the memory and inspires little but disgust in the minds of the pupils. At present a beginning only has been made; so far, the writer knows of only three geographical laboratories in

this country—that at St. Dunstan's, Catford, described in the December, 1906, issue of THE SCHOOL WORLD by Mr. Alford Smith; one to be opened at Leeds in September; and the one which is in process of equipment at Pontypridd County School. The last of these, which is in a temporary building, and was not specially designed for its present purpose, does not entirely fulfil the conditions laid down above, but is, it is thought, a considerable advance in the direction of providing adequate facilities for practical work.

It is a well-lighted room some twenty-one feet square, having three lofty windows in the south-eastern side and one opposite, and provides room for thirty pupils. The accompanying views will serve to give some idea of the general arrangement of the room. Fig. 1 shows the demonstration desk, the lantern on a temporary tilting-table, and behind it a reversible blackboard. One surface of this is scored with a penknife in two-inch

squares, and the other provided with a scored outline map of the world on Mollweide's homalographic projection. These markings are quite invisible at a short distance, and do not interfere in the least with the ordinary use of the board. This view also shows the geological 1 in. map of the eastern half of the South Wales coalfield in two frames, three sheets being in each; further to the right is the 6 in. map of the school neighbourhood, eight sheets in one frame. Above these will be hung a set of Philip's Comparative Wall-maps on spring rollers.

The pupils sit or stand at mechanical drawing-desks, of the kind shown in Fig. 2, which have the horizontal surface 30 in. above the floor, and have a groove to take the edge of the drawing-board. These desks, four in number, are so arranged that the teacher can pass up and down the room behind the chairs of two rows of pupils at a time; the chairs of half the class are turned round for a blackboard lesson, and all are brought to the space in front of the master's desk for a lantern lesson. For lantern lessons the room will hold two classes comfortably at once—an important consideration to a teacher who has to stand by a hot lantern, giving the same lesson time after time to three or four divisions of a



FIG. 3.

class, all doing the same work but at different times. The screen, which is of the exact size required by its distance from the lantern and the focal length of the lens, is made of white linen, strained on a light stretcher, made in the school workshop, and provided with a dark moulding by way of picture-frame. When the windows are darkened, although the light is not absolutely excluded, the image on the screen stands out brilliantly, separated by the dark frame from the rest of the feebly illuminated room. When not in use the screen is slung overhead by a system of cords and pulleys, and hangs with the white surface downwards, so that no dust can settle on it. When it is lowered until its edge is about five feet from the floor, the ends of its upper edge are each supported by a triple cord suspension from the roof, so that this edge hangs immovable; the screen is then set with its surface normal to the axis of the projection lens, by means of a hooked stay engaging in a screw-eye in the wall behind.

In Fig. 2 are also shown part of the 1 in. map of the County of Glamorgan (ten sheets in four frames), a relief model of the British Isles, and a map of Wales. A small group of surveying instruments is shown on and behind the centre tables; there are also shelves for exhibiting small models and "series boxes" from the museum. The museum itself, which is in course of arrangement, is accommodated in wall-cases in the corridor outside, as room could not be found for it in the laboratory.

Fig. 3 shows the northern corner of the room, with an apparatus case, the glass doors of which are utilised, by means of false backs held by turn-buttons, for the display of special maps and pictures; those shown are taken from the Harmsworth Atlas and the loose sheet edition of Philip's "Systematic Atlas." Another large picture-frame with loose back hangs on a part of the wall not shown in the photographs. The roll on the centre table contains the 25 in. map of the neighbourhood.

The south-east side of the room has three high windows, the bottoms of which are about three and a half feet from the floor; each window has at top and bottom a light which opens by falling inwards; the bottom light of the middle window has been made completely removable, and a carefully levelled shelf fixed outside, for sundial, gnomon, transit, and direction work.

THE INFLUENCE OF INSPECTORS AND INSPECTIONS ON SECONDARY EDUCATION.

By S. ELFORD, M.A.

Headmaster of the Coopers' Company's School, Bow, E.

Omnia mutantur, nos et mutamur in illis.

BUT a few years ago the headmaster of an endowed secondary school held an independent and almost autocratic position. He arranged his time-table and curriculum and organised his school to suit what in his opinion were the needs of its particular locality, and sometimes, even without considering those needs, to suit his own views.

He recognised no authority beyond the mild and generally superficial supervision of his governing body, and that of an external examiner, sometimes sent by a university, but who was more often a private individual—a country clergyman and retired schoolmaster—appointed by the governors often on the suggestion of the headmaster himself.

The success of the school depended almost entirely on the ability, initiative, and personality of the headmaster. He made or marred the school. Witness the many great schools that have sprung up in quite small towns and villages, the success of which can only be attributed to the influence of the headmaster, and the many almost defunct schools that have lately been resuscitated and are now flourishing. There were giants in those days—and the reverse. Now there is a

general levelling up, and in some cases, I am afraid, there will be a levelling down. A school can no longer plough a "lonely furrow."

Some twelve years ago a development commenced. The start was made with the bait of grants offered by the Science and Art Department for attendances at science and art classes, to be held at fixed hours in the school, coupled with visits by inspectors; then came additional baits in the form of grants in aid towards the cost of providing schools with properly designed and equipped chemical and physical laboratories. With these grants came more frequent visits of inspectors, concerned first with science and art only, and taking no account of anything else. Later mathematics and certain other subjects were added to the list on which grants might be earned.

As endowed schools have always been poor and governors on the look-out for means of increasing incomes, headmasters were urged to get grants, and increased grants, in every possible way, and so science and art—and in particular science—were developed at the expense of other subjects. The headmaster, being in those days usually a classical or mathematical man, did not allow classics or mathematics to suffer, and the change had to be given out of English, a subject to which insufficient time was usually devoted, and which in many schools was taught perfunctorily and by a "hack" master.

It gradually began to be realised that by placing a premium on one or two subjects, others equally important would come to be comparatively neglected, and to obviate this the Board of Education, as it had now become, commenced to recognise schools as a whole, and to pay grants for general efficiency; and what were called "organised science schools" came into existence.

By degrees a reaction set in, and the protests against excessive science teaching began to make themselves felt. To meet this feeling, schools were classed as "A" or "B," according to the amount of time devoted to science; but there was still a premium set on overloading the time-table with science, and the "B" schools, where less was done, were regarded as inferior, and a lower rate of grant was paid to them; moreover, the inspectors, still being the "science and art" inspectors, devoted their chief energies to science teaching.

With the advent of Sir Robert Morant and the passing of the Education Bill of 1902 a new régime commenced. The old inspectors from the Science and Art Department were drafted, almost without exception, either to the technical or to the elementary side of the Board's work. The machinery for the inspection of secondary schools was entirely remodelled, and a new inspectorate established. The classification of "A" or "B" disappeared, and schools were recognised merely as secondary schools. Science has been given a much-needed rest, and geometry, modern languages, English, and the pronunciation of Latin have received attention in turn. Rules, regulations, and suggestions for the more efficient teaching of each

have been promulgated, but I do not propose here to discuss or criticise the various memoranda.

When, by the new Act, secondary education was placed under the local education authorities, pressure was brought to bear, and all except the public schools and a few of the wealthier secondary schools have been compelled, as a condition of receiving maintenance grants, to place themselves under the regulations of the Board of Education. This means that for the future the inspectors of the Board will more and more control the aims and methods of secondary education.

The average headmaster will become more and more an executive official and less and less an administrator. The inspectors form the connecting link between the Board and the schools, and it is evident that all future regulations and developments will be to a great extent based on the inspectors' reports; at present the touch of certain inspectors is to be seen clearly in the memoranda on the teaching of certain subjects that have already been issued; but of course professional opinion will and must carry weight and influence. Without discussing the merits of our present inspectors, it is incumbent on the Board of Education to appoint, as vacancies occur, only the very best men—men who must be broad-minded and, above all, experienced—not merely untried academic successes or idealists, but practical men who understand that in teaching the real and the ideal are often somewhat removed; and the Board must, above all, beware of the faddist who sets up as "the authority" on his pet subject.

A tactful and experienced inspector should be, and is, of the greatest assistance to the headmaster. He has opportunities that a man engaged in active teaching cannot have; he sees schools of all kinds in all stages of efficiency, teachers good and bad, and he can give the most valuable advice and thus prevent, what is often so fatal, work getting into a groove. It is a truism that "lookers on see most of the game," and useful reforms and improved methods are more likely to come from those who view the subject from several points of view than from those whose experience must necessarily be limited to one or two schools.

The inspector, however, should remember that when he visits a school he comes as an inspector and not as a dictator. He can be the dictator when he speaks *ex cathedra* as the Board of Education in the memoranda which he has inspired. In the school he is still inspector until his official title is changed. It is rather annoying for a headmaster to be told that "in all my (the inspector's) schools this or that subject is for the future going to be taught in this or that way." The headmaster has still, by the scheme under which his school is worked, the right to choose the text-books and methods of teaching, and to fix the school hours and frame the time-table; though, apparently, what the Board—as the Charity Commissioners—gives with one hand it

—as the Board of Education governing secondary schools—takes away with the other. The inspector should also remember that all criticisms should be made privately and not before and in the hearing of the class, and preferably first of all to the headmaster. It should be mentioned, however, that in a fairly long experience of many inspectors, the writer has only come across one who was in any way wanting in tact or courtesy, and advice and suggestions have been offered in such a tentative way that there has been no loophole for taking offence.

Then as to the nature of the inspections themselves, both casual and "full dress," the tendency seems to be to confine the inspection almost entirely to the teacher and his methods, and to leave the results of the teaching out of the question. It is somewhat disconcerting for a teacher, time after time, to have an inspector enter his class-room with the words "Please don't let me interrupt you," then sit down, make a few notes, and after five minutes get up and go out with a "Thank you; good afternoon."

The proof of the pudding is in the eating, and of teaching in the result. A really good teacher is sometimes at a disadvantage and makes but a poor show in the presence of an inspector, whilst an inferior man may create a far more favourable impression. Successful teaching, especially of boys, depends more on discipline and the personal equation of the master than on method. Some of our professors of "theory and practice," and many of our idealists, if they were to be left alone for a week with an average form of thirty boys in order to test their principles for themselves, would probably modify their views. It is noticeable that the exponents of complicated systems and revolutionary methods are rarely people actively engaged in teaching in boys' schools. This, however, by the way. It is difficult for an inspector to ascertain the true atmosphere of a class-room, as neither boys nor master are working under quite normal conditions in his presence; however, in this respect I think injustice is but rarely done, as I have always found that where there has been anything to criticise adversely, the inspector has consulted the headmaster before writing his report.

In London and in some other counties, the local education authority has also its own inspectors, and as a condition of receiving grants all aided schools have to be open also to the visits of these inspectors.

The two authorities, as regards inspection, are independent and cover the same ground, both give grants, and so both claim the right to call the tune; unfortunately the tune called for is not always the same. What one praises the other may damn with faint praise. The inspectors do not recognise each other officially, and do not apparently exchange reports. This duplication, besides being vexatious to the schools, is surely unnecessary and is a waste of public money, especially when so many schools, even under the present improved conditions, are still starving for want of funds. There are rumours in London of

County Council "full dress" inspections and of County Council memoranda on the teaching of various subjects. Let us have but one inspectorate, of the combined authorities if necessary, but not dual supervision and control.

It now remains to be asked whether the changes of the last few years have been beneficial, and what effect the present system of inspections and inspectors is having on secondary education. There is no doubt that a great impetus has been given to education and greater efficiency is being secured all round. The position of assistant-masters in particular is improving, and they have, or are within sight of having, what has so long been sought, security of tenure. A school is no longer an isolated unit, progressing or not, unaided and uncared for; each forms an integral part of a national system. There has naturally been some feeling of resentment, and headmasters, who perhaps have held for many years independent and unfettered positions, have found it irksome to submit to the restraints and strictures of official regulations and to be put—in their opinions—in leading strings. But, with a little tact and diplomacy, the headmaster can generally obtain his own way; and latterly there has been a tendency to make the regulations more elastic, and to allow more scope for initiative. There is, however, the danger of secondary education becoming stereotyped, and though it may seem contradictory, the more gifted and highly qualified the inspectors, the greater is the danger of this. Permanent officials naturally lean towards a bureaucratic government; the greater the authority of the inspector the more reason he has for being dictatorial.

The regulations for secondary schools which prove annoying to a strong man who is an able organiser with views of his own will prove the salvation of a weaker man. Many good teachers lacking in initiative and administrative ability have been comparative failures as headmasters; some have failed from the want of a fixed policy, others from the lack of strength to complete reforms that they have commenced. In the average school, administrative ability will no longer be of such paramount importance. The new headmaster will find the policy and aims of the school he is to control already settled by the local authority. The subjects to be taught, the time to be devoted to each, and the methods to be employed, are laid down for him in definite regulations, and expert advice is always at hand for his assistance. The weaker he is, the more frequent will the visits of his inspector be, and the more help he will receive; and, conversely, the stronger and more capable a man shows himself to be, the less frequent will be the visits and attentions of the inspector.

There is no doubt that judicious inspection is stimulating for both boys and masters, and when the inspector makes it clear that he does not come as a policeman—in the hope of finding some regulation broken or something to criticise adversely—his visits will be more welcome than otherwise; but much depends on the inspector.

This article may be full of inconsistencies and seeming contradictions, but its object is to show that co-ordination is essential in a national system of education, and to ensure this co-ordination inspection is necessary. Unrestrained liberty is fatal to this, but a wisely restricted liberty will be beneficial. Times are changing, and school-masters must move with them.

ADDENDUM.—Since the above article was written and put into type the Regulations of the Board of Education for Secondary Schools for the ensuing year have been issued. Apart from the debatable question of universally free secondary education which is rather clearly hinted at, the new regulations mark a distinct advance. At last the Board has recognised the term as the unit, and realised that all boys do not progress at exactly the same rate or need precisely the same education. More scope for initiative is to be given, and the headmaster now will have the power to decide, or rather to suggest, the relative value of the various subjects in the curriculum. He will now have to map out a course of study and a time-table that meets the approval of his inspector, and not one to conform to inelastic and iron-bound regulations, read by the letter and not the spirit by very subordinate officials.

In these newly issued regulations the position of the inspector is emphasised, and his discretionary powers greatly increased. As forecasted above, the inspector becomes the principal factor in educational progress, and his responsibility is great.

THE TEACHING OF ENGLISH.

AN ENGLISH TEACHER'S REJOINDER.

By CHARLES J. PUGH, M.A.

Joint-Headmaster of the Little Appleby Preparatory School, Ryde.

THE casual reader of educational magazines may well exclaim: "The teaching of English must be in a very parlous state!" For their columns have for long past been filled with reproaches directed against the long-suffering English teacher. The man of science complains that the students in his laboratory come to him without the ability to express the results of their researches in passable English; and recently an exponent of the "New Latin Teaching" has laid the blame upon the same patient shoulders.

It may be granted at the outset that there has in the past been considerable foundation for these reproaches. It may be granted, too, that the cavillers do not stop here, but, like honourable men, have set themselves to outline a course or syllabus in order to remedy this state of things.

But may it not as readily be granted that the ranks of the English teachers contain at least a few conscientious men? Surely the preachments of the man of science and educational reformer have not all been wasted? I for one would like

to attempt to show that something is being done in the matter by the English teacher beyond the patient bearing of the critic's lash.

It appears to me that there is a very evident lacuna in this English controversy. On the one hand, there is the educational expert's storm of reproach; on the other hand, the patient and willing readiness of the English teacher to accept syllabuses and new methods. May not the gap be filled by some personal experiences of what is being done, by examples of individual work, and by the outline of actual lessons given in class? We have had an immense deal of theory; it may be illuminating to see something of the practice and occasionally the finished article.

The reproach most often levelled at the English teacher—a reproach undoubtedly borne out in the past by the results of the Army examinations and the average product of the public school—is that the English boy does not succeed in expressing his ideas in intelligible, not to say forcible, appropriate, English. This, then, is the form of reproach with which I propose to deal in this paper.

It is not too trite a precept even for this twentieth century of pedagogy that you cannot make bricks without straw. The pupil cannot be expected to write "decent English" without ideas. And here at the outset we are face to face with our first practical need—Ideas.

Fortunately for the teacher, the human brain—even the brain of the average boy—is full of ideas. How to elicit them is the question. Once elicited, we may proceed to express them appropriately. Even at the risk of delaying the practical portion of my paper, I must stay a moment to lay emphasis upon three necessities in the teacher's equipment, for without them he will not succeed. First, a personal equation of high value; secondly, the ability to arouse the interest and enthusiasm of his class; thirdly, a wisdom in the choice of subjects and a knowledge of English literature, sufficient to provide him with examples of the literary expression of nearly allied thought.

Now to proceed. A brilliant day in June, a universal atmosphere of happiness, a radiant and impatiently interested class—in the case of the teacher an unexpectedly good digestion—and the day's subject is not far to seek—"The joy of life." I cannot commend the teacher who chooses such a subject on a cheerless December day, or after some social cataclysm in the miniature school world. On the day indicated above, it is *per se* appropriate.

THE JOY OF LIFE is now written boldly on the blackboard.

Every teacher knows how baldly boys present their ideas: my point is that the concomitants of this particular subject are such as to induce the presentation of a goodly number. In a quarter of an hour the board is well filled, and there is enough material to proceed to their expression.

In Henley's "Lyra Heroica" there is a most appropriate poem—the Laureate's "Is life worth living?" It is most useful for our present case.

It is easily intelligible, it brims with nicety of diction, it is stirring patriotic, and, above all, it suggests the partition of our subject into its treatment *by seasons*. There only remains to quote the finished article. This is the work of a boy of nine.

You must have good health to enjoy life. It is not just the poor who don't enjoy life. If a man has plenty of money and not good health he cannot enjoy life. Think of the birds in spring that sing outside your window, when the birds are hatching eggs and building nests at the tops of the trees. When you walk through the woods and hear the birds chirping over your heads—"Is life not worth living then?"

Then when summer comes the birds go on singing just the same. When all the football's over and cricket has started, the sun comes out, the rain goes away, and the warm weather comes, you go about to watch the cricket matches—"Is life not worth living then?"

When autumn comes and the leaves are falling from the trees, the cold weather comes on again, you light your fires and run about to keep warm, and the boys at school play "Willy-wag-tail warning" to keep warm. The men go and shoot birds and take their dogs with them. "Is life not worth living then?"

Then when the winter and Christmas come, little girls and boys think of the little rhyme:

"Christmas comes but once a year,
But when it comes it brings good cheer."

They get, O such lovely presents! How some little boys come down in the morning of Christmas and say, "Mother, I have not slept at all to-night because I was so excited." "Is life not worth living then?"

Here I may be allowed to observe—as it were in parenthesis—that the direction of a boy's reading is a highly potent factor in the cultivation of style. I am sure, too, that as a general rule the literary proclivities of his home life are of the weightiest consideration for good or for evil in the boy's literary aspirations. That is to say, boys whose home surroundings are of a distinctly non-intellectual turn are severely handicapped as compared with the sons of a broader-minded breeding.

The English teacher sets himself to correct, as far as possible, such evident defects. With this aim in view, it has been my lot to indulge in a large amount of reading aloud, both outside and inside the class-room. Such an exercise may be made incalculably useful. In the choice of books there is some difficulty. In the case of young boys little is gained unless you avoid the Scylla of the Henty type, and the pupil is not yet far enough advanced for the Charybdis of the Waverley class. I will merely indicate here that boys find an ineffable charm in Jack London's "The Call of the Wild"; that portions of Winston Churchill's "The Crossing," notably the fine description of the Mississippi voyage, have afforded me many times an admirable object-lesson in sustained interest and style; that Erskine Childers' "Riddle of the Sands" has an unexpected attraction for the young. In proof that there is some result gained, I append a fragment with quite a Dickens flavour:

Author aetat. 12.

What a terrible thing is a storm! Tearing over the land like some animal that has escaped from its chains; bending the mighty pines until their heads sway from side to side uttering painful sighs; tearing over grassy fields; stripping the trees of their leaves which join in the wild dance for freedom; shrieking over cities with their slumbering peoples, over heaths, lingering here and lingering there to invest some ivy-mantled tower. Over the land it races whistling and shrieking with all the sounds of fiends. With a thousand tongues it races.

Over the cliffs on to the sea, where before it it drives Neptune's chargers headlong on; moaning through the rigging of ships; shattering sails and spars; tossing boats from side to side; conquering where it goes; leaving behind a mass of tumult; men clinging to spars with outstretched hands. Many a noble ship has seen its last.

A very common lament is that a boy's vocabulary is so small and inadequate. Of this no one is more conscious than the boy's teacher. Much reading will go far to correct this, no doubt. But it is remarkable how much good may be effected by non-avoidance in class-teaching of the "right word," by the non-substitution of an easy synonym. If terms such as "imperturbable," "obsolete," "seismographic," are the right ones and rise unpremeditated to your lips, why not use them? The blackboard is there on which to explain them. The harvest will be reaped after many days. One chapter in my copy of "Sentimental Tommy" is well-thumbed, and my classes are by now accustomed to the reading from it on the average of once a term at least.

"I ken the word now," Tommy cried, "it came to me a' at once; it is hantle!" . . . And Mr. Ogilvy said in an ecstasy to himself, "He had to think of it till he got it—and he got it. The laddie is a genius!"

When the average boy becomes a Tommy Sandys in his search after the right word, he is well on his way to write English.

To this form of teaching I attribute the use of many words in the following excerpts, the expressions being indicated by *italics*:

(a) The sea sparkles as if it were full of diamonds, and little ripples *undulate* the surface. (*Author aetat. 11.*)

(b) Then one notices a little stream, *meandering* through this modern Garden of Eden, reflecting in its *limpid* surface the ever-increasing rays of the sun. (*Author aetat. 12.*)

(c) The gallant young knight, after he has been *dubbed* knight and has passed the wearisome *vigil* praying beside his armour, sets forth. (*Author aetat. 13.*)

(d) Then there is a great clamour as all the furred and feathered *denizens* of the forest wake up. (*Author aetat. 13.*)

What remains for me is to append instances of the youthful blossoming of style. A exemplifies the piling up of sentences or of phrases to emphasise the meaning; B and C are illustrations of metaphor and simile; D and E are examples of appropriate diction.

A.

A person sitting in a room may look around him, and nine out of every ten things he sees would be an invention

for the benefit of man, which his ancestors did not possess. *The very chair he sits upon, the very windows he looks out of, the very plate he eats off, the very walls that enclose him,* are improvements for man's benefit which early generations before him had not.

Very few men who travel about and enjoy themselves think of the pains other people have taken to make the things he has to do with pleasant: *the train he goes in, the tunnel he goes through, the light that lights him,* very likely have caused the death of many people, and yet he does not think of it. (*Author aetat. 11.*)

B.

The wind blows over the cornfields, making the golden heads of corn toss from side to side, and from afar it looks like the ripples of some great sea with the setting sun throwing its last rays across and along them. (*Author aetat. 12.*)

C.

Like the police and detectives who hunt down the criminals of our country and bring them before the law and see that they are punished, so do the little birds and beasts. They hunt down the little mischievous insects which destroy the trees and plants; *they sentence them for their crimes.* (*Author aetat. 12.*)

D.

It is dawn. Misty shapes which resemble the ghosts of long-forgotten dawns lift from the waving trees. In the east the sky turns primrose and then red. Then bars of light shoot across the sky, and now the messengers of dawn come speeding from over the distant mountain peaks. *The golden gates open and Aurora comes forth driving her glittering chariot, with a pomp and splendour like ten thousand mirrors flashing in the sunlight.* (*Author aetat. 13.*)

E.

Nearly every day one sees the clouds, sometimes threatening, and at other times rolling by in mighty battalions, grim and grey, with ceaseless energy always advancing to some unseen goal. At other times black, motionless, and silent, sending ominous mutterings. Then this detachment of Nature's artillery, torn by flashes of light, roars with a din which makes all other sounds small in comparison to it. (*Author aetat. 13.*)

One more quotation, and I have done. It is the work of a boy of eleven, and, to my mind, embodies all the elements of his English teaching. It is lucid, imaginative, and restrained: it is full of verbal imagery, and contains just enough, and no more, of a quite poetic, sound alliteration.

In the country there are many pretty sights, but, prettiest of all, perhaps, are the silvery streams, abounding in minnows, joyfully rippling over the pebbles. It is a happy day, when the hours are idled away, and you lounge in a boat, half hidden by the reeds, while water-fowl swim about the stream, gladly enjoying this glorious day. Further down is the ford, across which cattle are driven every day. Here are some, revelling in the gladness of the bright day. The old bridge, now shaded with willows growing on the river's banks, affords a pleasant pastime for the village boys, who fish, whilst others look on drowsily at the lazy fish who lie at the bottom of the stream wondering whether it is worth the trouble to catch and eat those tempting flies. On the bank is a branch of a silver birch-tree, which extends across the

stream, on which a kingfisher is sitting, eager to catch the foolish fish, but too lazy. The only sound is the occasional chirp of a砌鸟, harmonising with the stealthy rustling of the light-coloured foliage, blown by the gentle Zephyr. Whenever he blows, all the silvery sisters sway, as though dancing, to and fro, backwards and forwards. This joy is completed with the flowers on the bank of the river. Buttercups, tinged with gorgeous gold, lilies, those flowers of purity, and daisies, their diminutive reflection, and around and beneath all, the grass; all reduplicated in the stream. The beauty of it all, coupled with the reflection of the sun, may well make anyone anxious to spend his time by the side of one such stream.

THE PROBLEM OF SUNDAY IN BOARDING SCHOOLS.

By A. G. LINNEY,
Ackworth School.

THE question as to the most profitable manner in which Sunday may be spent is one which must often cause the thoughtful schoolmaster grave anxiety. The subject presents such different aspects, each one of which must be considered, and, even when what may be called the theoretical side has been thoroughly examined, it is very probable that unavoidable local complications or special circumstances may render impossible the execution of what appears to be the most satisfactory course.

The division of time must be made with a triple object in view:

1. Adequate provision, without overdoing it, must be made for the spiritual side.

2. There must be full opportunity for a complete abandonment of the grind of class-work and lectures during Sunday.

3. The schoolboy has physical energies on seven, not six days of the week, and must have some outlet for these on Sunday as well.

To put the matter in a nutshell, Sunday becomes a problem in the right commingling of spiritual, intellectual, and physical interests. Having introduced the question thus, I now append information showing the division of time on Sunday in several boarding schools of very different types.

SUNDAY AT A CHURCH OF ENGLAND SCHOOL.

ETON COLLEGE.

8 a.m. Celebration of Holy Communion (alternate Sundays at this hour; after morning service alternate Sundays).

9 a.m. Morning prayers, followed by breakfast.

10.40 a.m. Chapel.

There is a three-quarter hour lesson in the morning also.

2 p.m. Dinner.

2.45-5 p.m. Leisure time.

5 p.m. Chapel, followed by tea.

In the evening there is music and singing, either in chapel or in the music school. Members of the Musical Society and others are at liberty to be present.

8.30 p.m. Supper.

SUNDAY AT A WESLEYAN SCHOOL.

THE LEYS SCHOOL, CAMBRIDGE.

8.15 a.m. Breakfast.

8.45 a.m. Prayers.

Leisure time. (Higher Form Scripture class, 9.30 a.m. to 10 a.m.)

11 a.m.-12.15 p.m. Chapel.

Leisure time.

1.15 p.m. Dinner.

Leisure time. (Voluntary prayer meeting, 1.45-2.5 p.m., managed by the Christian Union of the school.)

3-3.45 p.m. Scripture classes.

Leisure time.

4.45-5.30 p.m. "Silence in Hall."

Reading, letter-writing, &c., under supervision.

5.30 p.m. Tea.

Leisure time.

6.30-7.45 p.m. Chapel.

7.45-8.45 p.m. "Silence in Hall" (as above).

8.45 p.m. Supper.

SUNDAY AT A QUAKER SCHOOL.¹

ACKWORTH SCHOOL, NEAR PONTEFRACT.

8 a.m. Breakfast.

8.30-9.30 a.m. *Leisure time.*

9.30-10.15 a.m. Scripture classes.

10.30-11.30 a.m. Meeting for worship.

11.30 a.m.-12.45 p.m. *Leisure time.*

12.45 p.m. Dinner.

1.30-2.30 p.m. *Leisure time.*

2.30 p.m. Compulsory walk, weather permitting—lower forms under supervision.

4.15-4.45 p.m. Singing (in summer, bathing).

4.45-5.30 p.m. Letter-writing (under supervision).

5.40 p.m. Tea.

6-7 p.m. *Leisure time* (in summer). In winter, reading under supervision.

7 p.m. "Reading," the equivalent of School Chapel.

8 p.m. Retire.

SUNDAY AT A ROMAN CATHOLIC SCHOOL.

AMPLEFORTH COLLEGE, YORKS.

7.30 a.m. Early Mass; breakfast follows.

8.45-9.15 a.m. *Leisure time.*

9.15-10.45 a.m. High Mass and sermon.

11 a.m.-1 p.m. *Leisure time.*

1 p.m. Dinner.

2-4.30 p.m. *Leisure time*; public games are played, according to season.

4.45 p.m. Tea.

5.15-6 p.m. Study; religious instruction or English essay-writing.

6 p.m. Vespers and Benediction.

7-8.30 p.m. The school societies meet (Natural History, Literary, Debating, &c.).

9.15 p.m. Retire.

SUNDAY IN SCHOOL STORIES.—I have considered it worth while to see what has been told of Sunday in some of the more serious standard school stories. In Mr. Horace Vachell's book, "The Hill" (dealing, as most will recollect, with Harrow School), the author speaks of the Sunday afternoon walks which were such delightful opportunities for John Verney and "Caesar" Des-

¹ The school is a "mixed" one. The time-table applies to the boys' side only.

mond; he has, on the other hand, definitely said that, with a certain set of boys, "Sunday afternoon was a bridge fixture"—a statement which by no means implies that such a custom was anything but most unusual, so far as the bulk of the school went.

Dean Farrar's "Eric" shows "a Sunday afternoon towards the end of the summer term, and the boys sauntering about in the green playground or lying on the banks reading and chatting."

His first Sunday at Rugby was always memorable to Tom Brown. A few lines are worth quoting. "It was Sunday morning, and Sunday lectures had not yet been established; so that nothing but breakfast intervened between bed and eleven o'clock chapel—a gap by no means easy to fill up; in fact, though received with the correct amount of grumbling, the first lecture instituted by the Doctor shortly afterwards was a great boon to the school."

Few will have forgotten the description which follows shortly after this of Tom Brown's impressions of the first sermon he heard from Dr. Arnold.

THE SPIRITUAL SIDE.—In the majority of schools, no matter with what religious denomination they may be identified, there will probably be two portions of time set aside for public worship. In one of these the school will very likely form but a part of the congregation; that is, the pupils will be but units among the members of the human family collected for the expression of thankfulness or adoration to the great All-Father. This meeting together partakes of a totally different character from that of the "School Chapel" or "School Reading," or whatever one likes to call it. From the very fact that the congregation may include all ranks and ages, the spiritual sustenance provided by the preacher must be of a more general character and, at times, not especially suited to younger minds. On the other hand, the growing lad will recognise that the citizenship of the church does include young as well as old, and this broader view of life will be helpful, too.

When considering this spiritual aspect, it is well to remember that there are strongly-marked differences between individual boys in regard to emotionalism. Most schoolboys are fairly matter-of-fact, and we may take them as representing the average schoolboy mind; there will always be a small proportion, however, with whom there is a danger of undue introspection, or an excess of emotional sentiment taking so strong a hold as to become unhealthy. Such instances, when they arise, need most careful treatment in order that this tide of feeling may be wisely guided into healthy channels, neither allowing it to gain the mastery, and so cause neglect of the practical, everyday struggle which is necessary in life, nor yet to be harshly checked. Perhaps the most difficult case of all is that of the lad who appears hard and without higher feelings at all; then it behoves the schoolmaster to seek every means in

his power to find some cranny in the armour-plate of callousness where the first shaft may be placed.

BOOKS AND LETTERS ON SUNDAY.—Among older pupils in the school it may be assumed that there is access to a library containing choice works of verse, biography, history, and literature. It is well to allow older boys as much freedom as possible in their range of Sunday reading, though it is certainly advisable that, in periods of time devoted to reading or letter-writing under supervision, some definite oversight should be exercised. This oversight should, so far as possible, be exercised in such a way as not to appear markedly official: suggestions as to reading supplementary courses to study in hand or advice as to choice of biography may so be given as to lead without letting the pull of the reins be felt. With middle form boys, a class library of books reserved for Sunday reading only is often valuable, but it is useless to fill the shelves with dry volumes and insulting to offer mere goody-goody stuff. English classics in the cheap, attractive dress which now clothes them, good anthologies of verse, records of missionary work by men like Paton and Hannington; in addition, a few more serious volumes of a nature likely to lead up to further inquiry later—"How we got our Bible"; several copies of "Pilgrim's Progress" and of "The Holy War"—are all suitable.

A similar special Sunday library for the youngest, with "Black Beauty," "Parables from Nature," "Carrots," the delightful stories of Horatio Ewing, and so on, may be urged.

It has always seemed to me that the writing of a letter home is a very suitable occupation for part of Sunday, and I hold that we may do well to point out to our boys that to compose as interesting a letter as they possibly can, one that breathes themselves, is, in reality, the performance of a dutiful act in a spirit consonant with the day. In fact, this letter-writing, conscientiously done, may be a deed of unselfishness.

THE PHYSICAL SIDE.—How is opportunity to be provided for the schoolboy to "let off steam" on Sunday? Very probably, many of the older pupils, fagged with the six days of study, and perhaps stiff from a football match or cross-country run on Saturday, welcome the quiet of the day. But the lad of fourteen or fifteen, who has not risen to team work yet, has plenty of energy unspent on Sunday. In some schools there is an organised walk which answers the purpose in colder weather; where the school has its own swimming bath one or two bathe on hot summer Sundays are "grateful and comforting." When there has been a succession of wet days during the week, one has known the Head to allow as many as wished to change into flannels and take an hour in the gymnasium on Sunday afternoon; or in winter, under like conditions, to let such as will turn out, changed for sliding or a snowball fight. This may seem extreme to some, and I should hesitate to advocate such doings should the school be so placed that the performances of the pupils might give offence to neighbours. In any case,

perhaps, liberty to refrain should be allowed to any whose home-upbringing makes them hesitate to go with the crowd in these things.

Of late years there has been a marked stimulus given to nature-study in schools, and in most boarding schools there are more or less flourishing natural history societies. From one of the appended time-tables it will be seen that the naturalists hold their meetings on the Sunday evening. I imagine that in all schools which are so situated that it is possible for pupils to ramble in the surrounding country, there is little objection to be made to earnest naturalists pursuing—within reasonable limitation—their branches of research. Certainly one does not advocate permission for boys to go forth, as on week-days, armed with butterfly-nets or shell-scoops; as, however, the mere collector is a less popular type than formerly, this is not a great difficulty. Some authorities permit work at nature diaries and the drawing or mounting of specimens; and, surely, if the chronic loafer can be induced to work on these things, he is far more likely to keep out of mischief than if left unemployed.

SUNDAY WORK.—In the various time-tables appended to this article, classes in Scripture or in religious instruction appear. At Eton, pupils have a three-quarter hour lesson with their tutors, as well as "Sunday questions" to prepare. In the Roman Catholic college quoted (Ampleforth), a like period is set aside either for religious instruction or for essay-writing. The same period is given at the Leys School and at Ackworth School.

From this evidence it would appear that the tendency is to avoid exacting brain-work, and to let the mind have a large measure of rest from the strain of study. Certainly, in several schools with which I am acquainted, public opinion was strong enough to suppress any attempts by over-anxious or ambitious boys to work at the week-day class-work on Sunday. More mechanical work—map-drawing, illustrations for notebooks, and so forth—was permitted. It is difficult to draw a hard and fast line as to what may be allowed on Sundays.

In conclusion, seeing that THE SCHOOL WORLD comes into the hands of so many of us whose lives are led among those who will be the future citizens of our country, among those of whose souls as well as minds we have much to do with the fashioning—it is not, I deem, out of place to repeat that ours is a tremendous responsibility.

Surely there cannot be one of us who sees the scores of bright young faces ranked before us on a Sunday, but must realise this again and again. I am often reminded of the lines from "Rugby Chapel":

We, we only are left!
With frowning foreheads, with lips
Sternly compressed, we strain on,
On—and at nightfall at last
Come to the end of our way,
To the lonely inn 'mid the rocks;
Where the gaunt and taciturn host

Stands on the threshold, the wind
Shaking his thin white hairs—
Holds his lantern to scan
Our storm-beat figures, and asks:
Whom in our party we bring?
Whom we have left in the snow?

TEACHERS' PENSIONS.¹

By FRED CHARLES, B.A.
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II.

IN almost all European countries pensions are paid to the teachers by the State or community. In most of the German States, recent legislation has abolished teachers' contributions. The arguments advanced were that teachers, as officers of the State, were entitled to pensions just as much as officers in the Army and Navy; that they deserve the highest consideration, being the best of the State's agencies of conservation; and further that, of all the State's officers, teachers are the most likely to sacrifice health to duty. The pensions for elementary-school teachers may begin generally after 10 years' service; the minimum pension varies in different States between 25 and 40 per cent. of the last salary; in one State it is 60 per cent. The maximum pension is from 75 to 100 per cent. of the last salary after from 37 to 50 years' service. Contributions are required from secondary-school teachers in only two States, Saxe-Altenburg and Saxe-Coburg-Gotha. The minimum service entitling to a pension is less than in the case of elementary-school teachers, being generally one year, while the minimum pension is rather higher, from 25 to 50 per cent. of the last salary; in one case it reaches 70 per cent. The maximum is the same after from 25 to 50 years' service.

In Austria the teachers do not contribute except in some Crown lands. The pensions are from one-third to the whole of the last salary after from 10 to 40 years' service in the case of elementary-school teachers, and after from 8 to 30 years' service in the case of secondary-school teachers.

In Denmark both elementary- and secondary-school teachers contribute nothing, and receive from 10 to 66½ per cent. of the last salary after from 10 to 45 years' service.

Pensions are paid to both elementary- and secondary-school teachers without levying contributions by Norway, Sweden, Netherlands, Switzerland, and Hungary; to elementary-school teachers by France and, subject to a contribution, by Belgium.

Secondary-school teachers in Italy may retire from service on account of ill-health and still draw from one-half to three-quarters of their last salary according to the length of their service. In Spain such teachers receive two-fifths of the salary for two years after 20 years' service, three-fifths after 25 years', and four-fifths after 35

¹ The first article appeared in THE SCHOOL WORLD for July, 1907.

years' service, but only for two years. In Greece they contribute $7\frac{1}{2}$ per cent. of salary and receive 40 per cent. of their last salary after 20 years' service, and an additional fiftieth for each year after 20. In Portugal they contribute 10 per cent. of salary and receive a pension of one-third after 10 years' service, increasing to the whole salary after 25 years' service. In France the contribution is 10 per cent. and the pension two-thirds after 30 years.

In the United States teachers are not pensioned out of public-school funds except in Maryland, Ohio, and New Jersey. In some States the legislatures have, at the request of the teachers, framed laws for the establishment of pension funds, the distinctive feature of which is that no teacher shall be obliged to contribute. Voluntary mutual benefit associations—for temporary aid only—exist in Baltimore, St. Louis, Cincinnati, Cleveland, Detroit, Chicago, Buffalo, San Francisco, and St. Paul. Associations, for annuity or retirement only, are in New York, Boston, and Baltimore; the annual dues are 1 to $1\frac{1}{2}$ per cent. of salary up to 18 or 20 dollars. The annuity is from 60 per cent. of salary to 600 dollars a year. The time of service required for retirement is from two to five years with disability, or from 35 to 40 without. Associations for both temporary aid and an annuity exist in Hamilton County, Ohio, Philadelphia, Brooklyn, and the District of Columbia.

Of the State and city schemes three examples will suffice. The law of Maryland provides that any person who has taught in the public or normal schools for 25 years, has reached the age of 60, and is, by reason of mental or physical disability or infirmity, unable to teach longer, shall receive a pension from the State of 200 dollars (£40) per annum. An Act of the general court of Massachusetts to create a public-school teachers' retirement fund in Boston provides for a permanent and a general fund. The former is made up of gifts and legacies and a sum set aside by the board of trustees; the general fund consists of gifts and legacies not specifically given to the permanent fund, the interest on the permanent fund, and amounts retained for the purpose from teachers' salaries. The sum retained is three dollars each alternate month. The term of service is usually 30 years, 10 in the Boston schools. The amount of annuity is determined by the trustees as the fund will allow. Teachers who are incapacitated after two years' service may be paid an annuity. Teachers who have contributed for more than two years may, on retiring without annuity, receive one-half of the amount paid by them into the fund. The trustees are the superintendent, six teachers, and four members of the school committee.

The public-school teachers' retirement fund of Detroit consists of two funds: the permanent and the general. The permanent fund consists of (1) gifts, legacies, &c.; (2) moneys voted or raised by the board for this purpose; (3) tuition fees of non-resident pupils; (4) interest on daily

balances of moneys appropriated for teachers' salaries; (5) moneys which the trustees may transfer from the general fund. The general fund consists of (1) assessments on teachers' salaries up to 1,000 dollars, not less than 1 per cent. nor more than 3 per cent. per annum; (2) interest on permanent fund; (3) all moneys deducted from teachers' salaries for absence or any other cause; (4) all moneys intended for the retirement fund and not previously specified. The trustees are the president of the Board of Education, the president *pro. tem.* of that board, the chairman of the committee on teachers, the superintendent, and three teachers. Thirty years, of which 20 must be in Detroit, or 25 years in schools of Detroit, render a teacher eligible for annuity. Teachers who are incapacitated for duty, having taught 20 years (10 in Detroit), may be retired by a two-thirds vote of the trustees. Teachers who resign or are removed may apply after three months for such portion of their contributions as the trustees shall direct to be paid, not to exceed one-half of their contributions. Annuities are not to exceed 250 dollars. Current expenses are paid from the maintenance fund of the Board of Education.

At home pensions are not nearly so general. The Elementary Teachers (Superannuation) Act and the L.C.C. Pension Scheme were outlined last month. A few public bodies (for instance, the Central Welsh Board and the City of London) administer schemes which apply to teachers in their employ.

Under the scheme of the Central Welsh Board the teachers contribute from $2\frac{1}{2}$ to 6 per cent. of their salaries, according to their age at the date of the first contribution, the percentage increasing as the salary increases. The contributions of the county governing bodies are on a scale 60 per cent. higher than the scale for teachers. Teachers may retire at 55 and must retire at 65; but the appointing authority may call upon a teacher who was under 40 at the date of his first contribution to retire at any time after reaching the age of 60. The pension is 50 per cent. of the average salary received during the last 5, 10, or 15 complete years of service, whichever may give the greatest result. In the case of those electing to retire earlier, the equivalent amount of the pension is calculated. The teacher's contributions are returned in full if after paying at least two years' contributions he ceases to serve in a Welsh intermediate school and is not qualified for a pension, or on his death while in the service of a Welsh intermediate school. If after contributing for 10 years a teacher is incapacitated, he receives as many sixtieths of his average salary during the previous 5, 10, or 15 years as he has served years up to 30 years. In the case of teachers at schools under the Board at the date of the commencement of the scheme, the 10 years' minimum was removed so that if a teacher were incapacitated after contributing for five years he received five-sixtieths of his average salary.

The City of London scheme provides for a contribution by the employee of $2\frac{1}{2}$ per cent. of his salary, for retirement at the age of 65 on a pension of as many sixtieths of his average salary as he has served years up to 40. He must, however, have served at least 10 years. The Court of Common Council may, for the determination of the pension of an employee, add to his years of service any number up to 10 if he were over 30 years of age when appointed. In the event of a member dying while in the service of the corporation, and before he is in receipt of a pension, his contributions are returned to his representatives.

The schools which have pension schemes or retirement funds are not indicated, so far as I know, in any published list of schools. From information collected from and through personal friends, and from officials and members of the Assistant-Masters' Association, I have constructed a comparative table of the schemes in force in twenty-one secondary schools for boys, in addition to those in connection with the authorities before mentioned. Since in many cases the information was given as "private and confidential," I can give only a general summary of my comparison.

In rather more than one-half of the schools the management of the fund is handed over to one or other of the big insurance companies, many of which are now offering special terms to the members of the scholastic associations. In very few cases are the masters exempt from contributions; in a few cases house masters pay a capitulation fee on the boys in their houses over a certain number; in most cases the contributions from masters are about 5 per cent. of their salaries, though at one or two schools they must be sufficient to produce an annuity of a stated amount, say £150. The governing bodies contribute in most cases an equal amount; there are a few whose contributions are far more generous, and more whose contributions are less. The retiring age varies from 55 to 65, and is in most cases 60. Length of service varies very considerably. In some cases no masters are eligible unless they have served 25 years, while in others five years qualify them to draw a pension which increases with the years of service.

In very few schools are the retiring allowances worthy of the name of pensions; one scheme requires that the master and the governing body each pay a premium sufficient to produce an annuity of £150 at the retiring age of 60. A few schools give a percentage of the last or of the average salary; a few guarantee an allowance of £100 or £150 a year; but in the greater number the retiring allowances are the masters' contributions, together with interest, and all or part of the governors' contributions, with or without interest. The part of the governors' contributions generally depends on length of service. When a master withdraws or is dismissed before the retiring age is reached, he usually gets his own contributions without or with interest, but

nothing from the governors' contributions. In case of death the representatives generally obtain the master's contributions, and, in very few cases, that part of the governors' contributions to which he would have been entitled.

Several schemes are entirely permissive; i.e., the governors may, in the event of a master's retiring, give him an allowance, but to that allowance he has no claim. These schemes are in force in the larger and richer schools; suggestions for dealing with the smaller ones will be considered in another article.

THE STUDY OF LANGUAGES.

By E. L. MILNER-BARRY, M.A.

THE Scotch Education Department has issued a memorandum (Cd. 3540) on the study of languages to which we would direct the attention of teachers. It deals with (i) the place of languages in the curriculum; (ii) the teaching of modern languages; (iii) the teaching of ancient languages. It may profitably be studied in connection with the report recently drawn up by a joint committee of the Assistant-Masters' Association, the Modern Language Association, and the Classical Association on the ages at which languages should be begun,¹ and the annual report of the Board of Education for 1904-5.² "Who shall decide where doctors disagree?" The joint committee reports in favour of French before Latin, the English Board of Education lays down emphatically Latin before French, while in the memorandum before us the author emulates the cautious judgment of Sir Roger de Coverley, "Much might be said on both sides."

The present pamphlet is permissive, not mandatory, suggestive rather than dogmatic. A few general principles which may be accepted as reasonable and helpful are laid down, but there is nothing which in any way hampers the action or initiative of the teacher. Teachers first and then method, but it is assumed that the method will be in the main the "new method." *Non multa, sed multum.* Whatever language is chosen as the first is to be studied on the intensive system. The words of the author are worth quoting in full.

The truth would appear to be that, from the point of view of mental discipline, and thus as an element in a well-balanced course of education, a single language should suffice. Instead of dissipation of energy, there should be concentration of effort. If the language chosen for disciplinary purposes be wisely selected and properly taught, a pupil of fourteen or fifteen, who desires to specialise on the linguistic side, will approach the study of other languages with an equipment that cannot fail to be a guarantee of rapid progress.

As a consequence of this it is urged that when a second modern language is taught, attention should be paid to the utilitarian rather than the

¹ Cf. A.M.A., February 15th, 1907, p. 15.

² Cf. "Schoolmasters' Yearbook," 1906, p. 26.

disciplinary value; that if colloquial facility is desired, the teaching should be on these lines, but that if the object of the teaching is to foster a love of literature, a different method should be pursued. But we find no suggestion made as to how these conflicting interests are to be reconciled in the curriculum. We do not think that the supply of teachers at present warrants such a differentiation.

With some of the conclusions of the writer of the memorandum we are not in sympathy. We do not altogether agree that "as an examination test the 'unseen' may be defended. As an educational instrument, it is wholly vicious." Surely the judicious use of "unseens" in class is a direct and valuable stimulus to the pupils, breeds alertness in their powers, and can only become "vicious" in the hands of a slovenly teacher. Again, we read that "the singing of easy songs is also to be warmly recommended, but with the reminder that 'singing is of course more practicable with girls than with boys.'" This seems open to question; we believe that in England, at any rate, the singing of *Volkslieder* as a help to modern language teaching was introduced in the first instance into boys' schools, and that the experiment has been fully justified by results.

Incidentally we have testimony to the value of school libraries of modern language books. Speaking on this matter the writer says: "In a year or two the better pupils will be able and willing to read for pleasure in their spare hours at home. This is no counsel of perfection. There are public schools in Scotland where boys and girls of fourteen and fifteen have access, under the guidance of their teachers, to small libraries of foreign literature suited to their years. The success of the experiment has been surprising." This is good news, and should encourage the authorities of schools to be generous in expenditure of money on the provision of libraries and the purchase of apparatus for modern language teaching. At present we have still much to learn from the experience of other countries in this matter.

In discussing the teaching of ancient languages the writer summarises the various reforms which have recently been advocated, and comes to the conclusion, which we believe will commend itself to the majority of teachers, that the "new method" is not a suitable one to be applied in its entirety. Speaking of the efforts which have been made towards reform in this direction he observes:

Such endeavours cannot fail to be helpful. They will serve a good purpose even if they do no more than add a certain freshness to the daily round. But it would be idle to cherish the expectation that, under present conditions, it would be possible to apply the "new method" in all its fullness to the teaching of ancient languages. It is essential to the success of that method that the teacher should be himself a master of the foreign tongue as a living instrument; and Latin, no less than literary Greek, is dead beyond all hope of revival.

We agree that the "new method" has exer-

cised a certain amount of stimulus on classical studies by fostering a spirit of inquiry, and we believe that traces of this influence are seen in the greater attention paid to pronunciation, the simplification of the grammar, and the prominence given to *Realien*, but past experience seems to teach us the lesson that what may be called the "old method" has justified itself by its results, and we question very much whether it will ever be substantially modified save in the postponement of the study of Greek until a later period than the one when it is now commonly begun.

In conclusion we would express the hope that the memorandum before us may find its way into the hands of all teachers of language. It merits careful consideration, and cannot fail to suggest new ideas.

THE KING AND EDUCATION.

THE King laid the foundation-stone of the new buildings of the North Wales University College, Bangor, on July 9th. In reply to an address from the governing body of the college, read by the president, Lord Kenyon, the King said:

"I thank you for the loyal and dutiful address from the University College of North Wales which you have handed to me. The admirable work performed by the college in its temporary buildings has been widely recognised and was well known to me when I held the office of Chancellor of the University of Wales. I feel confident that increased efficiency will result from the facilities afforded by the commodious premises of which I have to-day laid the first stone. The competition in every branch of industry, especially in those branches which depend largely on science and art, is in these days severe, and it must be met by increased application and improved methods. The world is, I believe, better for such competition, but it behoves individual nations to use every possible effort to hold their own in the struggle. For this purpose higher education is an absolute necessity. However brilliant a man's natural talents may be, he is greatly hindered by the want of early training, and as a rule only those who have enjoyed a good education are capable of acquiring such proficiency in any branch of study as will enable them to succeed. The University College of North Wales will offer to its students exceptional opportunities of instruction. Time and money, energy and perseverance, will, I am sure, not be spared in the endeavour to afford every facility to the acquirement of knowledge, and I have had sufficient opportunities of judging the intelligence of the Welsh people and their eagerness in the pursuit of knowledge to know that your young men and women will take every advantage of the instruction which is offered them. Our thanks are due to the late Dr. Evan Thomas, of Manchester, to the citizens of Bangor, and other generous benefactors who have assisted in the great work. It is a gratifying feature of English

life to find rich men so ready to contribute to institutions where the young obtain advantages of study which might otherwise be beyond their reach. The president and the governing bodies will, I am sure, as expert trainers of youth, fail not in inculcating the moral qualities which build up such characters as are the part of a wise education. It is the character of the natives of Great Britain which, equally with their energy and enterprise, has given them the proud position which they hold in all countries in the world. The feelings of self-respect and self-sacrifice which are instilled in their minds from earliest youth, and are cultivated in institutions such as these, remain with them always, and are the means of making the people of this country respected and honoured wherever they go. I pray that by the blessing of God the good work of this institution may be long continued."

THE NEW REGULATIONS FOR THE TRAINING OF TEACHERS.

HERE are three sides to the Regulations for the Training of Teachers which have just been issued (Cd. 3597, price 6d., July, 1907) by the Board of Education. The first, the removal of denominational restrictions after 1908, received the attention of the House of Commons on Thursday, July 11th, in a debate reported in seven columns in the *Times* of Friday, July 12th, when Mr. Redmond contemptuously referred to the Regulations for Secondary Schools and Training Colleges as a couple of pamphlets issued without any notice. The second side is the very considerable revision of the undertaking to be required from students entering training colleges, and the third is the development of the courses of study prescribed for students.

The present declaration holds somewhat loosely, and after a student has obtained his parchment certificate by serving nearly two years in an elementary school, he considers himself fairly free to offer his services to other than the elementary branches. The problem of requiring a reasonable amount of service in public schools has received the attention of the consultative committee, and it generally recommends that all students in future are to enter upon a legally enforceable undertaking which provides for seven years' service in the case of a man, and five years' in the case of a woman, to be completed within ten years and seven years respectively after leaving the training college. Mr. Rankine, H.M. inspector, once reported on the sad havoc matrimony made in the ranks of the women teachers, and now our Jacob must wait five years for his Rachel, or pay an indemnity which is roughly computed at £15 a year for each year she falls short of her five years' probation. The expression "legally enforceable" is interesting. Can a minor enter into an agreement of this nature? One thing is certain: that unless a student does sign it, he will not be

admitted to a training college. We must also add that the expression "approved school" in which the student is to follow his profession may now be any secondary school in respect of which grants are paid by the Board.

The courses of study have also received the anxious consideration of the Board, which admits that it is greatly concerned by the increasing difficulty of securing for students who take university courses adequate instruction and training for the main business of their profession. The pressure of their academic work is so heavy that such students are at present often excused from courses in physical exercises and in manual training, and their training in the art of teaching itself and other professional subjects is often lamentably inadequate. These omissions are indefensible, and the conflict between professional and academic work seems to the Board to call for more serious attention than it has hitherto received, and so it may become necessary to require that teachers who have enjoyed the privilege of university courses shall produce evidence that the deficiencies, if there are any, in their professional equipment, have been properly made up before they are definitely recognised as certificated teachers.

A very valuable contribution to the methods of instruction is to be found in the prefatory memorandum to the regulations, and a real debt of gratitude is owing to Sir Robert Morant for it. He suggests that every education which deserves to be called complete must include some training of the student in those systematic methods of inquiry which are necessary for any assured advance in knowledge, and are the most truly educative of all mental processes. If this scientific spirit is to find its right expression in the teaching given in elementary schools, it must be made to affect the whole study of the intending teacher during his course in the training college. It must not be confined to any one branch in the curriculum. It is true that, partly as the result of tradition and partly from other reasons, the term "scientific method" has come to be associated more particularly with the study of natural phenomena. But as a matter of fact, scientific method is of equal importance, and is, indeed, a matter of ancient application in the field of history, literature, language and philosophy; and wherever knowledge of these has made advance, it may be discerned that the essential processes of scientific inquiry have been employed. When Matthew Arnold declared in 1868 that the want of the idea of science, of systematic knowledge, was the capital want of English education and of English life, he was thinking of science as a method and not as a prescribed portion or subject of a curriculum. It cannot be doubted that this want has been seriously prevalent in a large portion of the education and training hitherto provided for elementary-school teachers. Every training college therefore should attempt, even if it be only in a limited degree, to conduct its instruction, in as many branches of the curriculum as possible,

in such a way that there shall be in the case of each student some range of knowledge within which there is no fact and no inference from facts which has not been subjected to the severest test at his command.

Some minor changes are also made in these new regulations. The third class of the King's Scholarship is abolished, so now all who pass the examination are qualified to enter a college. Preparation of students for matriculation examinations are required to cease because the work prescribed in the course, together with the more distinctive professional studies, is sufficient to occupy an average student during the two years of his period of training. Thanks to the influences of the congresses of school hygiene, the Board has provided for the more adequate treatment of this subject by recommending that in the drawing up of schemes of work careful consideration should be given to the paramount claims of this subject. It announces that further steps will be taken with the view of securing for hygiene its proper place in the education and training of all persons intending to become teachers in public elementary schools. Further efforts are also to be made in the direction of nature-study, in the hope of making the scholars interested in the plants, birds, and other natural objects which surround them, and also with the desire of developing an independent habit of thought and of furnishing a well-defined field of knowledge derived from the scholar's immediate observation. This is excellent, and, indeed, looked at from the purely professional point of view, the adjustments of this year's regulations are a most satisfactory step in advance. All the syllabuses breathe the same spirit of self-development, and the general public may feel confident that the training of the teachers of the future will be at least on intelligent, rational, and thoughtful lines.

A PARCEL OF NEW READING BOOKS.

A VERY large assortment of books await recognition. *Juniores priores*—the little ones' books first. Mrs. P. A. Barnett (Black) has selected in "Song and Story" (three parts, 6d. each, and 100 pages each) a great deal that is not hackneyed, and a good deal that will be absolutely new to teachers. There is evidently a desire to get back to moral poetry, and the delightful verses will perhaps be useful to the young as they are certainly entertaining to the old.

Endure your mother's timely stare,
Your father's righteous ire,
And do not wriggle in your chair
Like flannel in the fire.

But there is only a section of "Shock-headed Peter" character; many dainty ditties are published by permission. The names of Boker, De la Mare, Thornbury, Rankine, O'Keefe, Hine, are not usually found in anthologies; and all is good, for the editor knows what is good. There

is plenty in these little books for a term's work in any class.

Messrs. Pitman send "Stories for Little Readers," by Alice Gibbons (four parts, 3d. each), well printed and brightly illustrated. The same publishers send their second primer (sound, symbol, and idea correlated), price 4d., an extremely interesting experiment which would bear enlargement; each reading illustrates and is illustrated by its picture. From Messrs. Bell we have the "York Poetry Books" (6d. and 8d. each) in three parts (about 100 pp. each). The verse is varied and well chosen. Messrs. Oliver and Boyd produce a series, "The Excelsior Reader and Poetry Books," to which the Reader (in three parts) is introductory (8d., 108 pp., and brightly coloured). The poetry books are arranged according to subject: Love of Nature, Flowers, Home Life, Courage, Fairyland, Noble Deeds, Great Thoughts, all have their sections. They are sold at 2d. and 3d., and again we notice, as in the "York Readers" and in Mrs. Barnett's books, how far afield the editors have gone. A new spirit seems to be coming over our book-makers, born of the uneasy question "Do we understand the child?" Messrs. Nelson go further still in issuing (2d. each) twenty-four books of song: Songs of the Nursery, of Childhood, of England, of the Empire, of Dreamland, of the Streams, of Maidenhood, of Quiet, of Endeavour, "miscellaneous collections loosely connected by the central thought." Black's "Picture Lessons in English" (6d.) and "Literary Readers" (1s.), with illustrations such as children love and can talk about, have been before noticed and praised in these pages. Messrs. Longmans send "Old-fashioned Rhymes and Poems" (1s. 6d., pp. 1-90), selected by Mrs. Broadknight—the title indicates the contents; and from Messrs. Methuen comes an easy "Poetry Book," arranged by W. Williamson (1s., pp. 1-116). Indeed, there is plenty of choice for the modern school.

Twelve plays of Shakespeare (the "Plain Text Shakespeare" they are called) come from Messrs. Blackie (4d. each). We have tested one or two and find they can be read with any class. This proves they must have been edited by someone who knows his work. They are admirable editions to get a great deal of work done with. "The Merchant of Venice" and "Julius Caesar" have also been published by Messrs. Chambers (4d. each) with introductions. This edition may be read in class too.

To their already long list of classics Messrs. Blackie add "Montezuma," the "Capture of Mexico," Philemon Holland's translation of Ammianus Marcellinus' "Julian," two of Macaulay's Essays, and two long extracts from Carlyle. The series has been welcomed by us again and again, and we hope it will continue and succeed. Especially good it is to get Philemon Holland's English into the schools. The books are edited by Dr. Rouse, and are priced at 6d. each. Fifty have been issued.

Messrs. Nelson, "to meet the demand for

literary reading matter of a high-class character," issue twelve little volumes (6d. each, 100 pages, in cloth boards). They are carefully edited, and, where necessary, simplified. Along with better-known books, such as Lamb's "Tales" (a very hardy volume) we find Hawthorne's "Great Stone Face" and Irving's "Sleepy Hollow." It is most encouraging to find publishers following the advice so often given in these pages, but we hope that the schools will back the publishers up. Can we not, too, have any further issues of "Westward Ho!" "Quentin Durward," Tennyson's shorter poems, and Lamb's "Tales" forbidden? There are many books (e.g., North's Plutarch, in the old spelling, part of a chronicle or two in the old spelling, first-class translations, well-written biographies, geographies of all kinds, so long as they are not like most of the present ones) crying for publication.

The A 1 "Bright Story Readers," so easy to handle (Messrs. E. J. Arnold, 4d. each) continue to come from the press. We have before us the "Seven Champions of Christendom," "Gulliver's Travels," and Lamb's "Tales from Shakespeare." With one exception, to be noted later, we do not know of books so excellent in form. Messrs. Bell send a clearly printed, well-edited copy of Kingsley's "Heroes," and an admirable "Stories of King Arthur" from Malory and Tennyson, by R. S. Bate (1s.). Prof. A. J. Church has written for Messrs. Cassell a really original "Stories from Ancient Greece" (6d.), illustrated. "Days before History," with a preface by Prof. Findlay, is written by H. R. Hall, and is an interesting introduction to archaeology. If the book means to help the children to "do" more and study less, it ought to be very welcome. But we do not want children (or women) in the factories if we can help it. The book costs 1s. 6d., is well illustrated, and will attract attention; but we need more "doing" in the schools, not more reading about doing.

Mr. J. M. Dent sends (in dainty form as usual) "Stories from Carlyle," "Voyages of Famous British Seamen," and "Tales from Browning" (1s. each). The last-named is really not for schools, but for young students of Browning. Where, except in the sixth form of girls' schools, are they? Wherever they are, the book will help them. Messrs. Macmillan have reprinted their wonderful sixpenny edition of the "Water Babies," "Alice Through the Looking-Glass," and, best of all, "Old Christmas." Everyone knows the illustrations of Walter Crane, Linley Sambourne, John Tenniel, and Randolph Caldecott. These books seem to us to touch the high-water mark of cheap, good, well-shaped and admirably illustrated literature.

Several larger and more ambitious volumes have yet to be noticed. Messrs. W. B. Clive send an "Anthology of English Verse" (pp. 1-262, 2s.), by Messrs. Wyatt and Goggin. The book contains introduction and glossary. Most of the extracts are familiar and well chosen. Mr. E. Arnold continues the "Epochs of English Litera-

ture" (the Johnson Epoch and the Pope Epoch), by Mr. Stobart (1s. 6d. each). Foregoing volumes have been noticed by us. These books also contain introductions and necessary notes. The Clarendon Press does admirable service with Mr. Hadow's "Growth of the Drama" (Oxford Treasury of English Literature, vol. 2), a volume which in 416 pages supplies all the necessary information and a wealth of illustration about the miracle plays, the moralities, and the early tragedies. The price is 3s. 6d., and we think the volume supplies a real want. It is a pity there are no pictures.

Of other big and handsomely got-up books we must single out Messrs. Harrap's "Stories from Dickens," by W. McSpadden; the "Stories from the Aeneid," by H. L. Favell; the "Stories from the Earthly Paradise," by M. Edgar; and the "Book of Rustem," by E. M. Wilmot-Buxton. The books are large, well printed, full of good illustrations, and the price (1s. 6d. each) is ridiculously low. It was a fine thought to reproduce from Firdausi the story which Matthew Arnold made so familiar; but, indeed, any one of the books might be a gift book, so attractively is it presented. They make one eager to stand before a class of boys or girls of twelve or thirteen years of age.

This long list is now finished. The few remarks on the books do not in any sense do justice to the new care and energy which publishers are showing. Is it too much to look forward to a time when the choice of the reading books in schools shall not be left to the haphazard and hurried glance of those who do not really know what is on the market, and shall not be governed by the unwise parsimony of authorities which demand expensive scientific apparatus, and leave literary apparatus uncared for and unpurchased? Why are so many schools still condemned to use publishers' rubbish, when publishers' jewels may be obtained for a little extra cost?

GREECE IN THE MIDDLE AGES.¹

SIR RENNELL RODD has not forgotten his sojourn in Greece, or those studies of which the first fruit was his charming little book on the customs and lore of modern Greece. Who, indeed, that has once fallen under her spell, can forget Greece? Here we meet our author in a new field, and one which promises much to the explorer. It is only recently that scholars have seen the importance of the history of Greece between the time when it became a Roman province and the fall of Constantinople. In this country, indeed, Byzantine history is still neglected, although both Germany and Russia can support an elaborate quarterly dealing only with that subject. We welcome, therefore, any sign of awakening interest here, and this substantial work

¹ "The Princes of Achaea, and the Chronicles of Morea." A Study of Greece in the Middle Ages. By Sir Rennell Rodd. With a map. 2 vols. xvi + 302, iv + 334 pp. (Arnold.) 25s. net.

shows that interest is awakening. Sir Rennell Rodd does not attempt a general history of Greek lands; he has provided only a local study, confined to the Frankish princes of the Morea and certain cognate matters. Many such studies must precede the larger undertaking which we hope for some day.

The author acknowledges in full his debt to his predecessors, particularly the great pioneer Hopf, without whom it is clear that this book would not have been written. Hopf's collections have been indispensable, and Hopf "an almost infallible guide"; but Sir Rennell Rodd has had collations and copies made in cases of doubt or apparent mistake, and has consulted documents which Hopf has not published in full; he has also made a more critical study of the Greek Chronicle of Morea, which has lately been published in scholarly form by Mr. John Schmitt (Methuen). Sir Rennell Rodd's judgment is sound, and he is a careful investigator; the reader may rely on his story as accurate, and if there be doubt in it, he will find the fact stated for his caution.

The work begins with the story of the Fourth Crusade, and the sack of Constantinople by the Crusaders in 1204. It is true Gibbon has dealt with this episode; perhaps the account might have been shortened for that reason, but it was right to say something, because this forms the connecting link between France and mediaeval Greece, and also because it is not generally understood that the Crusaders did more mischief than the Turks did in 1453. When the rule of Byzantium was thus weakened, the empire began to break up; and certain Frankish knights got a claim on the Peloponnese which they proceeded to enforce. The story of the conquest resembles in its daring and success the capture of Mexico; but once established, the Franks did not oppress their subjects, and all might have been well but for internecine quarrels amongst themselves. The great name of the early period is Villehardouin, who got his paramount position by a fraud, by which he ousted his liege lord Champlite. The characters of the persons of the ensuing drama come out quite clearly as on the stage: the Villehardouins, Guy de la Roche, Michael Palaeologus, and the rest. There are also the elements of tragedy, *ὕβρις, νέμεσις, περιπέτεια*. The next generation, with Florence of Hainault, Philip of Tarentum, and Isabella Villehardouin, is more complicated, and shows less individuality in the actors; until the death-blow is struck at the Frankish dominion in the Morea by the Catalan Company, founded by that astonishing adventurer, Roger de Flor. New families come on the scene: a few old names reappear; but the story now becomes less easy to follow, and we must leave it.

There are several descriptions of the castles built by these mediaeval Franks, most of which remain in some form to this day; and one or two rough plans are given. We should have been grateful for more of this. We hope that the British School at Athens, which is turning its attention in this direction, will give an exhaustive

account of these fine fortifications. An appendix contains longer notes and a few documents.

The book is agreeably written, except for one or two tricks of style (e.g., putting a descriptive phrase in the text, and a proper name in a note, without reference, i. pp. 145, 146). Is "image" the right word, by the way, on p. 52, for an *εἰκών* (picture) of the Madonna? That should have been shocking to the Greek Church.

THE TEACHING OF ENGLISH IN PRIMARY SCHOOLS.¹

THE memorandum on the teaching of English which has been issued by the Scotch Education Department is the first of a series intended to embrace all the main subjects of the school curriculum. Like the "Suggestions" of the Board of Education, these memoranda do not try to prescribe the courses of instruction in the various school subjects. They aim at presenting as clearly and succinctly as possible the end and aim of instruction in each separate branch, and indicating the leading principles that should be kept in view in the preparation of detailed syllabuses. Further, the memoranda are not put forward as final or authoritative documents. "Criticisms and suggestions will be welcomed, and will be carefully weighed with a view to issuing revised editions from time to time as experience may prompt." These words mark a new spirit in educational administration, and are the death-knell of the doctrine of departmental infallibility which has done so much to sterilise and stereotype school methods.

Coming to the subject-matter of the English memorandum, it may be said at once that it does not require the official imprimatur of the Department to command the attention of teachers. It is itself an educational document of first importance. Within brief scope it embraces the best that has been said and written on the teaching of English. But the memorandum is essentially an original contribution, original not so much in its firm grasp of educational principles as in its appreciation of the conditions under which these principles are to be put into practical application. From first to last the mental progress of the child during its school life and its mental attitude at different stages are kept steadily in view, and the matter and method of instruction are carefully arranged in accordance therewith. For the first time in an official document there is recognition of the fact that the circumstance and opportunities of schools and of pupils vary, and that what may fairly be demanded of one cannot and should not be demanded of another.

The sections dealing with poetry and school literature are exceptionally fresh and stimulating. The list of poems suggested as suitable for use in schools at different stages has the merit of containing all the old favourites. The framer of the memorandum has resisted the temptation to include novelties which masquerade as poetry in many of the latest school readers. It is impossible to do justice to the memorandum by means of extract, as it is woven of texture all compact, but the following selections may help to send readers to the fountain-head.

Aim.

The teaching of English in the primary school aims simply at enabling the pupils to understand, enjoy, and

¹ "Memorandum on the Teaching of English in Scottish Primary Schools." (Cd. 3410.) (Wymans.) 2d.

use good English of moderate difficulty, whether spoken or written. Spelling, grammar, etymology, &c., are to be regarded solely as means to this end, and pursued only so far as they conduce to it. Its attainment involves the systematic cultivation of thought and feeling as expressed in language. Hence the paramount importance of English in the elementary curriculum.

To English thus defined all other subjects lend their aid, in so far as they employ language as a medium of communication. All subjects, therefore, and all the ordinary routine of school life, give opportunities for incidental practice in English, which the teacher should use by making, and by insisting that the pupils make, all oral communications in good English, well pronounced, and thrown (if need be) into complete grammatical form. But such practice is incidental only. Correction of errors, or insistence on grammatical completeness, should not be pushed so far as to impede fluency or to distract attention from the matter in hand. The teaching of correct forms of speech belongs, in fact, to the systematic exercises about to be described; but, as correct forms are learned, they should be practised on all occasions, else the benefit of the systematic instruction will be lost.

Systematic instruction in English should begin with speech. Command of spoken English is not only of obvious practical value, and a thing to be acquired for its own sake, but supplies the best foundation for the study of the written language. It follows that, where the children's command of English on entering school is small, the introduction of reading should (if the age of the children permit it) be postponed until a certain degree of oral proficiency has been attained. Otherwise English names and sounds come to be associated primarily with symbols, not with things, whatever be the system adopted for the teaching of reading.

These principles plainly apply in full force to the case of Gaelic-speaking children. But even Lowland children vary greatly in their initial attainments in English, and the teacher's first business is to ascertain approximately what each child's attainments are, and to classify for English accordingly. This will, in the first place, suggest how long reading should be deferred. The application to composition is still more important, and will be discussed hereafter; and, in general, it is evident that, with such diversities of initial attainment, as between school and school, the same discipline cannot be applied at the outset to all schools alike, nor the same results expected from all at the end of the course.

THE UNDERSTANDING OF ENGLISH.

In the field available for the training of intelligence, English is not sharply delimited from other class subjects. But one part of that field may fairly be regarded as its peculiar property. It is the special province of literature to deal with human motive, character, and action. The main aim of the literature lesson, therefore, on this side, is to increase the child's knowledge of human nature, and, in so doing, to add to his stock of ideas about life, to give them precision, and to bring them into new relations. The mental processes involved, being in no sense peculiar to English, need not be discussed here. It will be enough to indicate the forms of literature appropriate to the primary school, and to outline a method by which they may be taught.

School literature should deal chiefly with human action, and should therefore be principally narrative (or dramatic) in form, proceeding from folk tales and songs to fables and parables, myths and legends (whether in prose or in

verse), romance and adventure, history and biography. It should also include sketches of travel and discovery, and descriptions of unfamiliar phenomena or processes likely to excite curiosity and imagination. Familiar aspects of nature, on the other hand, are best studied direct. Simple lyrics are always suitable; and some elegiac poetry of an obvious kind, even some very easy specimens of oratory and argument, may be attempted with the highest class; but there is little room for reflective, and none for purely subjective literature. Stories of child-life are naturally suitable for children, provided they be not too trivial. The simple conditions of primitive life are also easily realised by children; but many aspects of modern life may be made at least as interesting. For Scottish children the picturesque story of their own land is peculiarly appropriate, and so are some Scottish songs, poems, and ballads. Nor should tales and poems of merely local repute be disdained in their native localities, for they lie at the roots of popular literature.

Whether reading be begun at once or not, the teaching of literature should at first be entirely oral; it should continue to be largely oral until the mechanical difficulties of reading have been mastered; and to the end of the elementary course the reading of good literature aloud by the teacher should form a regular exercise. The main purpose of the lesson should be kept steadily in view, and not subordinated to, or needlessly complicated with, the mechanical art of word-naming, or the accomplishment of elocution.

THE APPRECIATION OF ENGLISH: POETRY.

But if the understanding of literature involves no mental processes which are not also involved in the understanding of history, and even of science, its emotional appeal marks it off very clearly from such subjects, and allies it rather with music and drawing. This appeal is made, in some measure, by all literature, but most characteristically by poetry. To poetry, then, this part of the discussion may conveniently be confined.

Repetition of poetry will be mentioned hereafter among expression exercises, and again among voice exercises. But these are merely incidental uses, for which its metrical form recommends it. Its peculiar function in the elementary curriculum is the cultivation of the emotions. What emotions can it cultivate, and how? The answer to these questions determines the choice of poetry for schools and the mode of teaching it.

Poetry selected for children must arouse no unworthy emotion; nor such potent emotions as terror, or even pity, to an overwhelming degree; nor can it properly appeal to instincts which have not yet arisen. But if an instinct is sure to arise and to need regulation, poetry can, in some measure, prepare for its advent by presenting its objects first in a pure and ideal form.

There remains a group of pleasurable or expansive emotions proper to childhood, and ranging from mere glee and frolic and mere delight in pretty things, through sympathy, love, and admiration on the one hand, and through joy in natural beauty and wonder on the other, to such deep sentiments as reverence and awe.

Viewed in this light, poetry in schools may become a powerful ally to morals by broadening and deepening the emotional nature, and so enriching the soil of the virtues. But its effect on conduct and character is indirect. It cannot replace moral instruction, much less the training of the will in habits of well-doing. Nor conversely are moral precepts poetry, though couched in verse.

Poetry, then, cultivates the emotions by presenting their objects in pure and ideal forms. Poetic ideas must be

concrete, for no one is moved by abstractions; and (beyond the stage of babyhood) their connection must be intelligible. But, though the children must be able to picture the images clearly enough to feel their force, poetic images need not have the definite precision that science demands. Some emotions, and those the deepest, depend on vague suggestions, which can be felt indeed, but not digested into words. So, too, though the whole poem must have a meaning for the children, it is by no means necessary that they should comprehend its full meaning as a grown person might. Narrative, as has already been shown, is the form of connection which children can best understand and enjoy. Selections for schools should therefore consist largely of narrative poems and ballads, or of poems which contain at least a thread of narrative.

ORAL COMPOSITION.

In all cases the first exercises in expression should aim merely at fluency, and should consist of singing games, guessing games, rhymes and familiar talks, all in the form of play, and designed simply to encourage the children to speak freely, whether in English, in Scots, or in Gaelic.

Where home English is fairly good and abundant, these familiar talks may soon be directed to the acquisition of accuracy in idiom and precision in vocabulary by correction of errors as they arise.

But the more scanty and debased the home English is, the more necessary it is to postpone this attempt¹ and to lay the foundations of English speech by purely imitative processes:

First, by actual repetition of folk-songs and rhymes, preferred to prose as more easily remembered, and chosen primarily for those qualities of simple vocabulary and idiom which they share with familiar speech.

Secondly, by reproduction of narrative or dramatic prose. If this exercise begins with folk- and fairy-tales of the familiar recurrent type, it will be at first a form of prose repetition, the reiterations which mark all genuine folk-tales helping the memory in the same way as the metrical recurrences of verse. The easiest stories are those in which the episodes are shortest and fullest of reiterations. Progress is secured by lengthening and varying the episodes, until the story approaches the ordinary type of continuous narrative and the reproduction correspondingly loses its character of mere repetition; and the children may ultimately try to invent episodes or stories, modelled at first on those which they have learned. The material thus acquired may be worked up by question and answer, by illustration and by dramatisation. But, beyond any explanations (by word, picture, or gesture) that may be needed for the comprehension of the story, such developments had better not be attempted until the story itself is fairly familiar. To this end it should be told again and again, always in the same words. Fortunately, children like an old story at least as well as a new one, and are great sticklers for verbal consistency.

WRITTEN COMPOSITION.

Written composition in the proper sense should not begin until the children have attained considerable proficiency in oral composition and in the mechanics of writing.

In respect of its medium, written composition is the last term in a series which begins with printing and proceeds to copy-writing, transcription, dictation, and

writing from memory. This mechanical aspect will be treated separately here, and should, as far as possible, be treated separately in actual practice.

In respect of the mental processes involved, written composition is essentially an extension of oral composition. But a speaker can make his meaning clear by the use of reiteration, inflection, and gesture. In written composition these aids to clearness are withdrawn. Their absence obliges us to bestow more care on the arrangement of matter, on the structure of sentences, and on the choice and order of words; and the comparative slowness of the medium allows this to be done.

The reproduction of a short narrative at something like its original length makes little demand on the intelligence, except to grasp the general drift of the story. But it reveals the most obvious peculiarity of written composition, viz., the conventions of the written sentence, and so affords an excellent exercise for beginners in breaking up a given whole into sentences. The transition from oral to written narrative may be made by writing on the blackboard to the children's dictation, but without punctuation, a story which they have learned, and then, by comparison with the original, breaking it up into sentences before their eyes. At this point grammatical analysis begins. The stories reproduced should be worth reproducing.

In descriptive writing, on the other hand, the matter (if previously discussed) may be said to be given in the form of sentences, and the problem is to connect these sentences properly. In describing a view or the like, it may be enough to follow the order in which things meet the eye. But in higher forms of description some sort of organic or causal arrangement is sought, proceeding from cause to effect or from effect to cause, from whole to parts or from parts to whole, whichever may be the more familiar. Even in its simplest form this is an exercise of great value and difficulty, and needs much help at first. It may begin with the attempt to reproduce a model description, the children's efforts being compared with the model and its superiority explained. (The teacher can build up the model on the back of the blackboard during the oral lesson.) Then the arrangement may be suggested by questions or heads of paragraphs, and the children may ultimately be left to supply both form and matter, and to describe their own observations in their own way. But some help will generally be needed. Again, it is of the first importance that the subjects chosen should be such as are worth describing.

From a very early stage, however, the children should be taught the common conventions of letter-writing, and be allowed to write letters freely. The main object of this exercise at first is to keep before the children the true purpose of written communication in the only form which most of them can comprehend. Their letters should therefore be real letters, giving the news, and should at first be very leniently criticised, if, indeed, their earliest efforts should be returned at all. Gradually, no doubt, a higher degree of correctness will be exacted, and formal exercises may be devised on the lines already indicated; e.g., the answering of invitations, writing of imaginary letters in given circumstances, &c.

¹ Note.—At this point scientific procedure would require the formulation of a minimum list of ideas and relations, which children ought to master before they proceed to formal instruction. But this has not yet been done for Scotland.

Studies in Plant Life. By J. Adams. viii+179 pp. (Dublin: Fallon and Co.)—This is a very serviceable little book for beginners. The account of the structure and functions of plant organs is concise and not overburdened with technical terms. The book also contains short chapters on habitat, as well as descriptions of the commoner poisonous plants. It is well illustrated.

HISTORY AND CURRENT EVENTS.

THERE is being held in Bruges an "Exhibition of the Golden Fleece" which illustrates, *inter alia*, the history of that famous order. It was founded in 1429 by Philip "the Good," Duke and Count of Burgundy, &c., &c. The present sovereigns of the two branches of the order are the Emperor of Austria and the King of Spain. How is this? Why are there two branches? Were these branches ever rivals? Are they so now? The answer to these questions is to be found in the history of the heirs of Philip the Good. Who was his granddaughter? Whom did she marry? Who was her eldest grandson? Who was his brother? What was their family name? and how is it that the present King of Spain is not of that family and yet is a sovereign of the order?

ANOTHER Russian *Duma* has been dissolved. But the Czar agrees with Sir Henry Campbell-Bannerman, and cries: The Duma is dead, long live the Duma! For another assembly is to meet in the autumn. We can get so little trustworthy news from Russia that it is all but impossible to understand the real history of the revolution that is progressing in that country. But in a declaration of last June the Czar says: "The Duma, summoned to strengthen the Russian State, ought to be Russian in spirit. The other nations forming part of our Empire ought to have representatives of their needs in the Duma, but they ought not to appear, and shall not appear, in numbers which make it possible for them to be the arbiters on questions which are purely Russian." In other words, Russia is too big for a parliament containing representatives of all its inhabitants. There are too many conflicting interests, and the only possibility of representing these would be by means of a federation like Austria-Hungary or the United States of America. But Russia is like the British Empire: it is not homogeneous enough for federation by way of assemblies. It must be federative only by bureaucracy, and while Greater Britain has "colonial conferences" from which India is excluded, Greater Russia has an official class which watches over non-Russian subjects.

SUGAR is a sweet thing, but its manufacture and uses may lead to much bitterness. The sugar-cane planters of Jamaica want an abolition of all bounties on beetroot cultivation, in order that it may be profitable for them to grow the cane. But bounties on beet sugar help to cheapen sugar for everyone else. There is accordingly a direct conflict of interests between Jamaica folk and the confectioners of Great Britain. Cheap sugar also helps folk in France to put on the market wines which compete only too successfully with the natural juice of the grape produced in southern France, and the inhabitants of four departments are demanding taxes on sugar to save their own industry from extinction. Other folk are to have dearer sugar in order that they may live. The Jamaican folks only petition, but the French vine growers have burst into open rebellion, and what will be the end of it is not at present visible. How we all love protection of our own industry, but object to it for other folk's. We are all producers of one thing, consumers of many.

WHEN in September, 1850, Messrs. Barclay's draymen thrashed General Haynau, and when in October, 1851, English people generally welcomed and applauded Kossuth's speeches in Shakespearian English, they were thinking of the Magyar revolt against Austrian rule, of Haynau's cruelty, and of Kossuth's patriotism in 1848-9. They did not inquire too closely into the objects of Magyar revolt,

but were satisfied to believe that they were "liberty" for Hungary. "Liberty" is a glorious word, and covers a multitude of sins. What use are the Magyars making now of the liberty which they failed to get in 1849, but which they attained in 1867 and have had ever since? They have passed a law this last June by which the relations between landowners and their employees are made mediæval. Serfdom is practically restored, and all the old "droits du seigneur" that we thought were things of the past. So far, for internal matters. In external matters, they hate the Croats, whose Ban, Jellacic, helped to conquer them in 1848-9, and a new Ban of Croatia has been lately appointed who believes in governing that country in Magyar interests. Trouble is expected.

ITEMS OF INTEREST.

GENERAL.

THE conditions of tenure of assistant-teachers in secondary schools have just been brought prominently before the public by the case of Wright *v.* the Marquess of Zetland and others. This case was heard in the King's Bench on July 17th and 18th before Mr. Justice Lawrence and a special jury. A new headmaster, Mr. Prestwich, was appointed to Richmond Grammar School in the summer of 1906, to enter upon his duties on September 21st. On September 10th the four assistant-masters of the school received an intimation from Mr. Prestwich that he intended to begin work on the 21st with an entirely new staff. No cause was assigned for this summary dismissal. The four assistant-masters consulted the Assistant-Masters' Association, who obtained the opinion of counsel and determined to support Mr. Wright, who was chosen to represent the four masters concerned, in bringing an action against the governors of the school for wrongful dismissal. The evidence of Mr. Wright, Dr. Gow, Dr. Fry, Mr. Gabbitas, and others amply satisfied the jury that the custom of the profession was a full term's notice, and they awarded to Mr. Wright the full amount claimed. But Mr. Justice Lawrence then decided that, under the Richmond scheme, which is similar to the schemes of 99 schools out of 100, there was no contract between the governors and the assistant-masters, and he entered judgment for the defendants.

This case, so far as it has gone, makes plain the insecurity of the position of assistant-teachers in secondary schools. The governors disclaimed all responsibility in regard to the assistant-masters, and the judge upheld their contention on the point of law. Equity, as represented by the jury, decided that the dismissal was wrongful. If the judge's ruling is upheld by the Court of Appeal, to which the case will probably be taken, assistant-masters will have to consider themselves the personal servants of the headmaster. This is made clear by the judge's remark, in answer to the argument of counsel, that the school was represented by the governors, and that the assistant-masters were the servants of the school so represented; he replied, "You might as well say they are liable for the servants engaged by the headmaster." It is not possible for assistant-teachers to accept this position, and it would not be good for the schools that they should. At the same time, it is scarcely possible for headmasters to remain under the responsibility, financial and otherwise, which this judgment fastens upon them. If Mr. Justice Lawrence's judgment should be upheld by the Court of Appeal, united action on the part of head- and assistant-teachers to get the law amended would seem necessary.

THE Board of Education has addressed a letter to the Somerset local education authority on the subject of the respective liabilities under the Workmen's Compensation Act, 1906, of local education authorities and the managers of non-provided schools to the teachers employed in provided and non-provided elementary schools within the area of the authority. The question of whether a teacher in an elementary school is or is not a workman within the meaning of the Act is one ultimately for the decision of a court of law, and the Board of Education has no power under the Act to give a binding decision on the subject. In the event, however, of the employers of a teacher in an elementary school being held to be liable to compensate that teacher under the Act, in respect of personal injuries by accident arising in the course of that teacher's employment, it may be that questions may arise between the education authority and the managers of a non-provided school in which the teacher is employed as to whether that liability rests upon the authority or upon the managers. The Board of Education is advised that in such circumstances it would be the Board's duty, upon the question being referred to it, to decide the question as between the authority and the managers. The Board has sought legal advice with a view to guidance in the event of such a question being referred to it.

THE Board is advised that teachers whose salaries do not exceed £250 per annum are within the provisions of the Workmen's Compensation Act, 1906, and are entitled to compensation as that Act provides, if injured by accident arising out of and in the course of their employment. The persons primarily liable to pay compensation to a teacher so injured are the employers of the teacher, and the Board is advised that the employers within the meaning of the Act are the persons with whom the teacher has entered into his contract of service. In the case of provided schools, therefore, the persons liable will be the local education authority. In the case of non-provided schools, the employers of a teacher for the purposes of the Act are, generally speaking, the managers of the non-provided school. The Board is also advised that the payment of compensation in cases of accident has now become a necessary incident of the employment of teachers, and therefore that, subject to the consideration of the facts of any particular case, the managers of non-provided schools are entitled to be indemnified in respect of any compensation paid by them under the Act by the local education authority, upon whom the maintenance expenses of the school are imposed.

A MEMORANDUM included in the annual report of the Association of Headmistresses, dealing with the domestic training of girls leaving school at sixteen, raises a question of great importance. The memorandum begins by insisting that the association "is keenly alive to the fact that it would be a great advantage to the nation at large if all girls attending secondary schools could receive a thorough training in the domestic arts on scientific lines, such training to be given as late as possible in the school career." Whilst holding this view, the association recognises that there are serious difficulties in the way of such a training for these girls, who must earn their own living without delay. In many cases, the memorandum states, the difficulties are insuperable. The bulk of these girls hope to become clerks or teachers; domestic work, as at present organised, offers no career to the middle-class girl who has to earn her living outside her own home, although it may be work which in itself would attract her.

THE memorandum, inconclusive though it is so far as its recommendations are concerned, may lead to a consideration of the character and aim of the curriculum of the ordinary secondary school for girls. There appears to be no consensus of opinion as to what constitutes an ideal school preparation for a girl of the "middle classes." The present curriculum in girls' secondary schools is a very close copy of what has proved more or less satisfactory in boys' schools. It is true that botany is often substituted for chemistry and needlework for manual training, but essentially the course is the same in both cases. Does this condition of things demonstrate the essential similarity in the educational needs of boys and girls? Or, does it mean that, having proved the necessity for secondary education for girls, the estimable pioneers of women's education in the "eighties" had not originality enough to lay down the lines upon which the curriculum for girls should be fashioned, and contented themselves with slavishly copying the course of work provided for boys? In any case, the subject offers a fruitful field for inquiry, and we recommend the question to the attention of the Association of Headmistresses.

NAPOLÉON—Ajaccio, Notre Dame, Ste. Hélène—was the subject of a most interesting lecture delivered by Prof. A. P. Huguenet at Queen's College, London, at the end of June. M. Huguenet prefaced his lecture by laying it down as essential that a speaker should be, above all, interesting to his audience; he certainly realised his ideal on this occasion, as attention was riveted to the very close of the discourse. Starting from the observation that great men belong to the whole human family, and not to the particular nation they chance to be members of, he rapidly traced the general's birthplace, the intellectual superiority of his family, and his military achievements prior to reaching the zenith of his glory. At this point the constructive genius of Buonaparte was touched upon: the drawing up of the "code Napoléon," the organisation of State finance, the foundation of the Légion d'Honneur, the reorganisation of the Université de Paris, and the Concordat with Rome. If in the second act—Notre Dame—the hero was admirably depicted as tragedian and comedian (a compliment paid him by Pius VII.), in the *dénouement* sympathy was enlisted for the great criminal whom the lecturer pathetically compared with Prometheus filching fire for the human race.

Two courses of lectures open free to teachers will be given at Bedford College, London, during the Michaelmas term. One, on "Geology for Teachers of Physical Geography," by Dr. C. A. Raisin, begins on October 9th at 6 p.m.; the other, on "The Organisation of Nature-study Courses in London Schools," by Miss M. R. N. Holmer, begins on October 5th at 10.30 a.m. Syllabuses of the lectures can be obtained on application to the principal at the college.

THE Middlesex Education Committee and the Hornsey Borough Council have arrived at an agreement as to the provision of secondary education in Hornsey. A school for boys and a school for girls will be established first, at each of which the curriculum will provide for tuition up to the age of eighteen. If satisfactory terms can be arranged, the Stationers' Company's School will be the school for boys, while two high schools for girls at Stroud Green will probably be amalgamated and used temporarily for girls. The fees at both schools will be from three to five guineas per term, with a number of free places and reduced fees.

A REPORT recently adopted by the West Sussex Education Committee contains the recommendation that secondary schools for girls shall be erected at Chichester and Worthing. It is estimated that the Chichester school will cost more than £12,000. The cost of the Worthing school is estimated at about £13,500. The sites already approved afford space for the future erection of boys' schools, but before entering upon the provision of these it is proposed to approach the councils of the two towns for local contributions. No contributions are asked for the girls' schools, because they are considered to be a necessity for the county as a whole.

IN connection with the centenary of Mill Hill School, a fund is being raised for the provision of additional buildings and scholarships. Mr. Herbert Marnham, now president of the Old Mill-Hillians' Club, gave £10,000, by means of which a block of class-rooms has been built and is already in use. Lord Winterstoke, chairman of the Court of Governors, who was captain of the school sixty years ago, and has been one of its most generous benefactors, has lately given £10,000 to the Centenary Fund.

THE Lord Meath Empire Day challenge cup inter-all-secondary schools of the Empire, with the £5 5s. League of the Empire personal prize attached, has been won by C. H. H. Jerrard, of Brisbane Grammar School, Queensland. Subject: "The Conditions of Successful Colonisation." Essays competing for this cup and prize were sent in from South Australia and Queensland; Rhodesia; from four provinces of India—Bengal, Madras, Bombay, and Burma; and from Demerara as well as schools in many parts of England. The challenge cup inter-all-primary schools of the Empire, with the £3 3s. League of the Empire personal prize attached, has been won by Eva Fayan, of the Senior Government School, Jamestown, St. Helena. Subject: "The History of British India." For this prize essays were sent in from England, Natal, Transvaal, Orange River Colony, Rhodesia, Queensland, Bengal, Burma, Hong Kong, Mauritius, St. Helena, and Demerara. The judges of the Empire Day essays were Mr. H. W. Eve, Mr. E. D. A. Morshead, and Prof. Ernest A. Gardner.

A PARLIAMENTARY paper has been issued containing a copy of the draft Order in Council, providing that the term of office of the members of the Teachers' Registration Council shall be further continued until March 31st, 1908, or such other date as his Majesty in Council is pleased by Order to direct; and that the constitution of the Teachers' Registration Council shall, unless and until otherwise provided by Order in Council, continue as at present. The Order comes into force on August 1st.

THE Cambridge Local examinations commenced on July 15th at seventy-one centres in the United Kingdom and two centres in the West Indies. The total number of candidates was 3,332. This is the first year in which examinations take place in July as well as in December. An important change in the regulations for 1908, which may now be obtained from Dr. Keynes, Syndicate Buildings, Cambridge, is the issue of new schedules in botany for all the examinations.

THESE schedules show evidence of the change which is coming over the methods and aims of botanical teaching, and presumably may be regarded as an official recognition of the new movement. A comparison of the new and old syllabuses shows that increasing importance is to be

attached to naked-eye work and to experiments performed by the students themselves upon living plants. Thus, even in the requirements for senior candidates, no specific mention is now made of the flowerless plants, while even in the study of flowering plants the use of the microscope is recommended only, "at the discretion of the teacher, for the examination of organs the function of which it is difficult to understand without some knowledge of their microscopic structure." Again, the number of natural orders prescribed for study for both senior and junior pupils is much reduced, and the teacher is warned that "the student should not begin the study of flowers by learning the characteristics of various natural orders." Finally, it is evident that in the framing of the course of work in all three grades, the first object has been to emphasise the conception of the plant as a living thing and an efficient machine. The syllabuses cannot fail to win the entire approval of all who recognise the educational value of botany.

AT a meeting of the Historical Association held at University College, London, on July 6th, a London branch of the association was formed. Prof. A. F. Pollard was chosen president, Miss M. B. Curran secretary, and Miss Bazeley treasurer. A temporary committee was also chosen to draw up a draft constitution to submit to a meeting of the branch on the first Friday in October. An interesting paper was afterwards read by Mr. G. Laurence Gomme on "History and Anthropology."

IN 1904 a new method of selection of boys for entry at Osborne College was sanctioned by the First Lord of the Admiralty. This plan for the supersession of competitive examinations was described in an article in THE SCHOOL WORLD for April, 1904. The method has proved very successful, we understand, so far as Osborne College is concerned, and seems likely gradually to be adopted by other authorities in the place of the more orthodox scholarship examination. The headmaster and governors of Clayesmore School, Pangbourne, announce their intention to follow the lead of the Admiralty in their award of two major and two minor entrance scholarships. The object in offering these scholarships is to attract boys to the school who up to the age of fourteen years have been educated on broad and liberal lines, without any attempt at early specialisation. What will be regarded as most important will be such work as evinces accuracy, thought, and originality. Each candidate will be interviewed separately by the examiners, and the report of former tutors or schoolmasters will receive consideration.

ALL children attending the school dental clinic at Strassburg for treatment now receive a pamphlet containing the following advice: "At the age of two and a half years every child has twenty teeth. The first permanent molar appears at the back of the mouth in the sixth year. Permanent teeth replace the milk teeth between the years of seven and fourteen. The second molars appear in the twelfth year, and the third molars, or wisdom teeth, after the eighteenth birthday. Sound teeth are necessary for the health of the stomach and of the whole body. The milk teeth are of more importance for the child than the permanent teeth are for the adult. Sound milk teeth are a condition of sound permanent teeth. The teeth must be brushed every morning, and especially every night, with a brush of medium hardness. A salt water solution should be used, and every second day a preparation of chalk. Twice a day the tonsils should be cleaned by gargling. Every half year, from the age of three upwards, the mouth

should be examined by the dentist. As soon as teeth, and especially the milk teeth, begin to decay they must be filled or toothache will result. The mouth must be kept continually clean; all roots which have not been filled must be extracted, and all tartar must be removed. Artificial teeth are but a poor substitute for natural teeth. Good mastication means easy digestion."

SCOTTISH.

PECULIAR interest attached to this year's Leaving Certificate examination papers, as they mark the close of the old system of individual subjects and of end-term examinations. Few will be found to regret the former, though in their day they did notable service in raising the standard of scholarship in the secondary schools of Scotland. Comparing the papers set when these examinations began in 1887 with those of this year, no one can fail to be struck with the enormous advance that has been made. Such a comparison, indeed, brings home to one in a vivid manner the extent of the educational revolution that has taken place during this period. In every subject there is evidence of a vastly broader and truer conception of what constitutes knowledge. The little peddling details, the glorification of exceptions, the extreme emphasis on memory work, have all disappeared. Instead, there is a demand for a firm grasp of general principles, an appeal to the intelligence and the imagination, and a call at every stage for clear and accurate expression. The Education Department is certainly entitled to rank as an educational reformer by its record in the field of secondary education. Of course, the initiative has seldom come altogether from it, but it, at least, has been quick to respond to every educational advance that had a considerable body of enlightened expert opinion behind it.

THE English and modern language papers perhaps bear most trace of the newer and better methods now common. The lower English paper was a perfectly delightful paper, and well within the range of the average pupil. The higher paper was distinctly to the difficult side. To ask pupils of sixteen and seventeen years of age to compare in respect of language, &c., three translations of the same passage from Homer, and to assign each of these extracts to its period, is making too big a demand on pupils and schools. The first part of the question is meaningless and valueless save to a student of Homer in the original, and that a fairly advanced one. The papers on modern languages reflected strongly the prevailing tendency in the teaching of these subjects, and the "direct" method is writ large on all the questions. The papers in Latin and Greek, though by no means unfair in themselves, are markedly so in comparison with those in modern languages. Any pupil after a three years' course should be able to get a pass in the latter, while it would take a very good fourth-year pupil to secure anything like fair marks in classics. Now that the "group" certificate is fairly established, a strong endeavour should be made to secure something like equality of standard between the optional subjects of the group. This year modern languages are a "soft option" indeed.

THE position of the Education (Scotland) Bill seemed so precarious, if not hopeless, last month, that a deputation of a somewhat unique kind was appointed to wait upon the Prime Minister in regard to it. The members of the proposed deputation were representative of the leading school boards and of the Educational Institute. This is the first time that the pressure of common interests has

brought these bodies together, but it is hoped it will be recorded for a precedent that will have many successors. The Prime Minister has written to Mr. Alexander, Clerk of the Edinburgh School Board, who was making the arrangements, stating that he did not think a deputation necessary at this time, as he was already thoroughly in sympathy with the desire to pass the Education Bill this session. He was quite aware, he said, that the long delay in passing such a measure was greatly detrimental to the educational interests of Scotland, and assured the educational bodies concerned that the Government would do all in its power to pass the Bill. These words are very satisfactory so far as they go. But having regard to the state of public business in Parliament, and to the time available before the end of the session, there is just a suspicion in many quarters that these are but "words, words, words." For our part we accept them as expressions of the honest intention of the Government, and still hope for the passing in some form of the Education (Scotland) Bill.

AT last month's meeting of Glasgow University Court it was agreed to approach the Privy Council with the view of obtaining an amendment of the ordinances in regard to the curriculum and the length of session. It was also resolved to appoint in the Arts Faculty an official adviser, who would guide the students in their choice of subjects. The question of fixing an inclusive fee for Carnegie Trust beneficiaries was also under consideration, and general approval of the principle was expressed. It was remitted to a small committee to consider what this fee should be.

IRISH.

A MOVEMENT is on foot for starting a Classical Association for Ireland. The Standing Committee of the Royal University having referred the question of adopting the reformed pronunciation of Latin to the Board of Classical Examiners, the latter called a representative meeting of professors and teachers of classics to discuss the feasibility of establishing some form of classical association to consider this and other matters for the improvement of classical studies. The result was the formation of a large provisional committee representative of Trinity College, the Queen's Colleges, University College, Magee College, the Intermediate Board, and Roman Catholic and Protestant secondary schools. A circular is being issued inviting support for the proposed association, the object of which is stated to be "to furnish opportunities for an interchange of views among persons interested in Latin and Greek studies, for the suggestion of improved methods of teaching, and for the general promotion of classical knowledge." The object is thus seen to be not inimical to other societies or other branches of study, but intended to foster and improve the teaching of classics *per se*, for which there is ample room in Ireland. It will also be useful in bringing together members of different creeds and parties to discuss some problems of education which they have in common. The present intention of the committee is to hold a general meeting in the autumn, about the end of September, formally to inaugurate the association. The provisional hon. sec. is Mr. J. Thompson, 14, Brighton Road, Dublin.

THE debate in the House of Commons on the Irish university question raised on the Irish estimates for the Queen's Colleges shed some rays of light on the Government's attitude towards it. Mr. Birrell disclaimed any intention of shelving it, but it is clear that he thinks Mr.

Bryce's scheme requires modification. His position is that no University Bill is likely to pass unless it is the result of general agreement and a friendly conclusion, especially when the composition of the Government's forces in the House is considered. His own object, therefore, is during the autumn to try to secure all-round support for a measure to be submitted to Parliament next session. His attitude to Mr. Bryce's scheme was semi-apologetic. It was not, he said, an impossible solution, in spite of opposition from Trinity College, but some of the heads of colleges who had supported it had not fully grasped its nature; he was therefore communicating with persons who had supported it in order to find out if they would equally support any other possible solution. Mr. Bryce's scheme, therefore, is to be modified in such a way as to reduce the opposition and to secure general support for the solution of a vitally important problem.

THE General Assembly of the Presbyterian Church in Ireland had in June two important educational questions before it. The first concerned the report of the Higher Education Committee on the university question. This was in favour of the general lines of Mr. Bryce's scheme of a single university for Ireland, and although two or three amendments were proposed, particularly one by Mr. Thomas Sinclair, which protested against one sole university with constituent colleges as being detrimental to the interests of education, nevertheless the report was adopted. The figures were, however, small on both sides, and were not accordingly a convincing representation of either the pros or cons.

THE other subject was the bequest to Magee College, Londonderry, under Mr. Basil M'Crae's will. His estate amounts in all to between £70,000 and £80,000. The income of this is to be paid to his sister during her lifetime, and after her death to the trustees of the college. The trustees are to signify their acceptance of the bequest within two years after Mr. M'Crae's death. The college is now Presbyterian, with a theological department for the training of Presbyterian clergy; by the bequest, the college is to become undenominational, £12,000 to £14,000 being set apart to provide two professorships and for building improvements. Two "M'Crae lectureships" are also to be endowed, £500 is to be spent on two scholarships, and the residue to be applied in prizes. The committee produced a report for accepting the scheme, but, some difficulties arising with regard to the separation of the theological department from the college, it was referred back, with instructions to report again next year.

THE Technical Instruction Congress met this year in the City Hall, Dublin, under the chairmanship of Dr. Windle, President of Queen's College, Cork. A great deal of discussion took place on the Department's regulations with regard to syllabuses and grants, but Mr. Fletcher, the assistant secretary of the Department, being present, greatly helped to explain and smooth away difficulties to the satisfaction of the congress. The question of the provision of an efficient scheme of scholarships came up, and technical instruction committees were urged to provide apprentice scholarships for the more promising and deserving pupils. Another burning question was the urgent necessity for the immediate provision of adequate grants for the building of technical schools. Resolutions were also passed in favour of the control of evening continuation schools remaining under the National Board, and of the necessity of the settlement of the university question.

WELSH.

THE great event of the month is the laying of the foundation stone of the new buildings of the University College of North Wales, Bangor, by his Majesty the King. At the luncheon, Mr. Lloyd George, M.P., after referring to the gigantic task of attempting to raise £200,000 among a population of peasants, shepherds, and miners, said he thought they were entitled to crow over the sacrifices which the Welsh people had made and were making for education. They had the highest education rate in the United Kingdom. Wales was the only country where people bragged about their rates. For university and technical education the contribution they were making out of the rates was six times that of England; for secondary education, on contributions out of rates, it was nine times that of England; and there was not a country in Europe that would compare with some of our Welsh councils in the rates which they raised for the purposes of secondary and higher education. What the city of Bangor had done should inspire other cities. Bangor had contributed £21,000 towards the college. Take the village of Llanuwchllyn. Every householder, the workmen, the village tradesmen, the village blacksmiths, had contributed to the college. That was a great achievement. The people had done something themselves instead of waiting for the Government. In recognition of his services to education, the King conferred the honour of knighthood upon Principal H. R. Reichel.

THE Lords Commissioners of his Majesty's Treasury have appointed a committee to inquire into and report upon the character of the work accomplished by the University of Wales and its constituent colleges, the financial position and lines of development of the colleges, and their probable requirements for the staffs or otherwise. The members of the committee are: Sir T. Raleigh (chairman); Sir John Rhys, principal of Jesus College, Oxford; Principal Donald Macalister, Glasgow University; Mr. F. G. Ogilvie, C.B.; Prof. W. S. M'Cormick; and Dr. Alexander Hill, Master of Downing College, Cambridge. Mr. G. L. Barstow, of the Treasury, will act as secretary to the committee.

As had been announced in Parliament, the regulations for the training of teachers in training colleges, just issued, contain the requirement, "In training colleges in Wales provision must be made for the teaching of Welsh." The effect of this requirement, as explained by Mr. McKenna, is that there must be on the staff of every training college in Wales at least one person competent to teach Welsh. It is also provided that students may obtain, on their ordinary certificate, on leaving college, a statement of the fact that they have passed a satisfactory examination in elementary Welsh, or (when this is the case) a mark of distinction in the Welsh language. There is thus compulsory provision of facilities for studying Welsh, but apparently it is left to the colleges to require (or not) Welsh students to study Welsh.

THE scheme for Welsh is given in appendix D of the training college regulations. The preamble runs: "The optional course in Welsh will be divided into two parts: (a) elementary Welsh and (b) higher Welsh. Students will not be allowed to take the Board's examination in higher Welsh at the end of their second year of training unless they have passed the Board's examination in elementary Welsh at the end of their first year of training. Any student may, however, be examined in elementary Welsh at the end either of the first or the second year of training

without proceeding to higher Welsh." The aim of the course of study is described as intended to lead the students towards an appreciation of the best that has been written in the Welsh language, and to give them a command of good literary Welsh. The books recommended, therefore, are to be studied from the literary and stylistic rather than from the historical and philological point of view. A theme or essay will be set in the examinations in both courses. In both the elementary and the higher Welsh books are named for general reading and for detailed study, and translation is required of unseen passages from Welsh and English authors. In addition, in the elementary Welsh outlines of Welsh grammar are prescribed, and in the higher Welsh an outline course on the structure and idiom of the Welsh language.

A NEW movement in connection with the teaching of Welsh should be noted. Several of the Welsh churches in Cardiff have arranged for evening classes for the teaching of Welsh for the benefit of Sunday school scholars. It is suggested that an attempt should be made to bring the classes up to the requirements of the Board of Education as grant-earning classes.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Molière, Les Précieuses Ridicules. Edited by G. H. Clarke. xviii+94 pp. (Blackie.) 8d.—This is really a capital edition of Molière's very amusing play. Mr. Clarke knows his Molière well, and this is by no means the first play of his that he has edited. The introduction is full of interesting information, the notes give all that is required, and there is a very good glossary. There is hardly a remark to which we take exception. Mr. Clarke will excuse us if on reading "Le Menteur" we found it anything but monotonous; and we should be grateful to him if he could bring forth good evidence for his statement that the Précieuses first began to speak the uvular *r*. We know the theory, but thought it had been exploded long ago.

Fleur de Neige. By E. C. Hainsselin. 30 pp. (Blackie.) 4d.—A very simple version of the tale of Snowwhite, suitable for a class of young girls. The author has added instructions as to costume and the dances, and the music of a song (in which, by the way, *or* rhymes with *alors*). A pretty playlet, which we recommend.

Pages Choisies des Grands Écrivains Modernes. By W. G. Hartog. iv+102 pp. (Rivingtons.) 1s. 6d.—Fairly long extracts from V. Hugo, About, Thiers, Gautier, and other standard writers, dealing with a great variety of subjects. Mr. Hartog has supplied French notes and exercises, consisting of a questionnaire, questions on grammar (unapplied), and *exercices écrits*, to which more attention might have been given with advantage. The number of misprints is not formidable.

Scribe et Delavigne, Le Diplomate. Edited by W. G. Hartog. 77 pp. (Rivingtons.) 1s.—Where are we going to draw the line? Anything more silly than some of the songs included in this *comédie-vauville* it would be hard to imagine. The plot has a certain amount of flashy cleverness; but this does not suffice to make the book good reading for our pupils. We prefer to say nothing about the illustrations and the misprints.

A. de Lamartine, Le Manuscrit de ma Mère. By L. E. Farrer. viii+62 pp. (Arnold.) 1s.—It was a happy thought to make this selection. The text is divided into twenty-four sections, to each of which there is a set of exercises consisting of a questionnaire, questions on grammar and word-formation, and a few lines for re-translation. The last are not always couched in simple and idiomatic English, which is a pity; to the rest of the exercises we can give almost unqualified praise. The vocabulary is altogether incomplete. The printing of *très* with a hyphen following is now quite out of fashion and should not have been retained; apart from this, we noticed very few misprints.

E. de la Bedollière, Histoire de la Mère Michel et de son Chat. viii+135 pp. (Arnold.) 1s.—This queer story, anonymously edited, quaintly illustrated, will serve for rapid reading in an intermediate class. The exercises appended remind us strangely of those in Mr. Hartog's series: questionnaire, a few crude grammar questions, a few slight suggestions for written work. The presence of misprints (*une miaulement*, *Académie français*, *mâitre*) detracts from the value of the book.

H. Seidel, Aus goldenen Tagen. Edited by Dr. W. Bernhardt. viii+144 pp. (Heath.) 1s. 6d.—This capital selection from "Reinhard Flemmings Abenteuer" makes a first-rate reader, describing as it does the amusements of German boys with much genuine humour. Dr. Bernhardt gives some account of Seidel's genial personality; an excellent portrait serves as the frontispiece. There is a complete vocabulary and notes which afford all the help that is required. Here and there we come across a Transatlantic touch, or a piece of "fine writing," but generally the notes are altogether satisfactory.

H. Sudermann, Teja. Edited by R. C. Ford. xi+69 pp. (Heath.) 1s. 6d.—The editor has written a good introduction to this fine one-act play, which will prove of great interest to an advanced class. Notes and vocabulary give evidence of careful work.

Goethe, Iphigenie auf Tauris. Edited by P. S. Allen. xlvi+218 pp. (Ginn.) 3s.—It might be thought that we now have a sufficient number of editions of "Iphigenie." The only novel features here are the questions on the text, which are certainly good, and a vocabulary which is complete. The introduction is satisfactory, but would be better if there were less of it; why will American editors be so verbose?

Classics.

Life in Ancient Athens: the Social and Public Life of a Classical Athenian from Day to Day. By T. G. Tucker. xiv+212 pp. (Macmillan.) 5s.—Dr. Tucker has written a readable little handbook on an interesting subject. It is also a wide subject, so that in a book of this size there must be selection and avoidance of excessive detail; anything like an attempt to "rival the dictionary of antiquities," as Dr. Tucker puts it, must be a failure. This being so, the first two chapters seem to be out of place, discussing as they do the general questions of the Greek races and the topography of Athens. To a certain extent this is also true of chapter iii., which deals with bricks and mortar. The fourth chapter describes the social conditions of "citizens, outlanders, slaves, and women," interspersed with anecdotes; and a description of houses and household furniture follows. And now we turn to the most interesting part of the book: the daily life of the people. An imaginary citizen is followed from rising to

sleeping, and on the way his dress, surroundings, and occupations are described, partly with the aid of pictures. Touches of reality are added by the frequent quotation of a sentence from Demosthenes or Plato or Aristophanes, which come in neatly in the right places. A great deal of knowledge, and no small skill, is needed for such an account as this. At the end of the evening's enjoyment, Dr. Tucker adds with evident relish: "There were no after-dinner speeches." But perhaps he has forgotten the Symposium of Plato? The more serious employments of the men are reserved for later chapters. The story of the girl's life occupies the next chapter; there is plenty of humorous incident from Aristophanes and the delightful dialogue in Theocritus.

Our imaginary citizens, man and woman, marry, and have a son, whose existence is the excuse for a chapter on school life. It is comforting to see that, although education was not compulsory, military service was: and we see here how and when the lad had to serve, how he put on his armour, and how he rowed in his galley. Religion now engages our attention: sacrifice and festival, theatre and musical competition. The Assembly and the Law Courts follow; and finally, our hero is buried and sent over the Styx. A brief account of art and architecture brings us to the last chapter, the modernness of the Athenian, a slight analysis of his genius and tastes.

The book well deserves a place in the school library, and it will enable the learner to realise more fully the surroundings of those whose works he reads in the course of his studies. We do not think Dr. Tucker's style is beyond reproach (the greater part of p. 206, for instance, is out of place in the book, although it would be in place in the writer's mind); but it is worth reading.

The Virgil Pocket Book: Vergilius Musa Consolatrix. Arranged by S. E. Winbolt. With an Introduction by Arthur Sidgwick. xxviii+78 pp. (Constable.) 2s. net.—This is a tiny booklet containing a number of Virgilian extracts, varying in length from half a line to twenty, the Latin being faced on the opposite page by a prose translation. The extracts are arranged under these heads: Husbandry, Fame, Work, Patriotism, Death, Man, God. Doubtless, as it is said in the preface, no two scholars would make the same choice; but it is also true that no scholar with taste could fail to make a good choice. Most of the thoughts here given are worthy of remembrance, many are touching, some really consoling; all bring back to the scholar's mind the echo of past emotions, the memory of delightful hours spent in company with one of the gentlest

sons of men. If we miss some old friends (where, for instance, is *sunt lacrimae rerum?*) we see others that may have slipped our memory. We hope the editor is not too sanguine in expecting those who read no Latin to peruse the book: to them especially we recommend it.

Select Epigrams from the Greek Anthology. Edited by J. W. Mackail. 176 pp. (Longmans.) 2s. net; leather, 3s.—Prof. Mackail's edition of select epigrams from the Greek Anthology, with translations, notes, and introduction, has long since been recognised for a standard work. The present volume, one of Longmans' Pocket Library, contains the Greek text alone. It was a happy thought indeed to publish this in a handy form; it will be a welcome companion to many a scholar's travels. It contains the quintessence of that priceless collection, and nothing second-rate.

The Annals of Tacitus, XI.-XVI. Translated by A. V. Symonds. 250 pp. (Swan Sonnenschein.) Cloth, 3s. 6d. net; leather, 4s. 6d. net.—

The first volume of this translation has already been noticed in our pages; the second is like it, an unpretending piece of work, without remarkable faults or virtues. The style is diffuse as compared with the original, but an English reader will get a very fair idea of the author otherwise.

Dona Reginae and other Latin Scenes for Acting. By B. Orange. 22 pp. (Blackie.) 4d.—These scenes are very short and very simple, and are well suited for the use of young children beginning Latin. We wish there were more of them.

Latin Unseen in Prose and Verse. Elementary Section. 32 pp. (Blackie.) 3d.—Nothing differentiates this from others of its kind. The extracts at first are short, disconnected sentences, simple followed by compound, illustrating various parts of accidence or syntax: then come prose extracts, and lastly verse, varying from four to twenty lines. It is impossible to get any interest into scraps like these, most of which are incomplete fragments of longer scenes; but the book will suit those who use such books. For a rational scheme of reading they are quite unnecessary.

Greek Reader. Vol. ii. Selected and adapted with English Notes from Prof. von Wilamowitz-Möllendorf's *Griechisches Lesebuch.* By E. C. Marchant. vi+96 pp. (Clarendon Press.) 2s.—The pieces in this volume are: Stories from the Life of Aesop; parts of Plutarch's Pericles, Alexander the Great, and Scipio; the Customs of the Celts, from Strabo and Poseidoni; seven Characters of Theophrastus; the battle of Salamis, from Aeschylus;



School scenes; vase by Duris. From "Life in Ancient Athens."

the Theory of Vacuum, from Hero of Alexandria. These are all unhandyed pieces, and the Greek is not easy; the book is thoroughly interesting, and will be an excellent reader for more advanced students. The notes are judicious, and do what they should do, explain the text without solving the reader's problems. If for nothing else, such a book is welcome because it shows what capital stuff may be found in the byways of Greek literature.

History.

Factors in Modern History. By A. F. Pollard. xi+287 pp. (Constable.) 7s. 6d. net.—Prof. Pollard is, or should be, well known to our readers as the author of the latest books on the Tudor Period, "Henry VIII," "Cranmer," and "Somerset." In these lectures he gives us the essence of his views on this period, and on some matters in the seventeenth century. They are eminently readable, full of humour and of maxims of wisdom on history and politics. Our readers could not do better than take this volume away with them for holiday reading. It is just as interesting as a novel, and far more useful.

An Introductory History of England. Vol. ii., 1485-1660. By C. R. L. Fletcher. xv+583 pp. (Murray.) 5s.—Our readers may remember that we reviewed the first volume of this work some months ago, and that it attracted the "general reader" and the daily newspaper reviewers as "history as it should be written." It is an attempt to present history in an unconventional way, clear of dry-as-dust, for our elder scholars, in the hope that they will read it for its own sake. We have been interested in seeing how Mr. Fletcher would manage with Tudor and Stuart times. In the former, he is clearly under the guidance of his friend Prof. Pollard, to whom he dedicates this volume; but in the seventeenth century we wish he could have read more than "one quarter of the authorities" recommended to him. In the remainder he might perhaps have found reason to give a more sober account of the Puritans and Separatists of whom he has occasion to speak. His point of view is avowedly that of a moderate "low Churchman," and, though sympathising to a certain extent with other parties, especially with Oliver Cromwell, he has apparently not got to the heart of the movements which appeared during the Civil War and Commonwealth under the name of "the sects." With this exception, and it is a large one, his book may be recommended for our school libraries.

An Illustrated History of England. By W. S. Robinson. Period I., to 1660. viii+402 pp. (Rivingtons.) 2s.—This little book differs little, if at all, from other such short histories of our country. The illustrations are good, and have short explanations, not always complete enough; the text is smooth and clear, and there are not many variations from the newest orthodoxy as to facts. Among these variations, perhaps the most important are the putting forward of Peter the Hermit in preference to Pope Urban as the instigator of the first crusade (p. 76), the "Salic Law" (p. 166), the sketch of Wat Tyler and the rising of 1381 (pp. 185 sq.), and the foundation of grammar schools by Edward VI. (p. 286). How the author arrives at his interpretation of the letters "PR" on the coin on p. 295 is beyond us. His ideas on the religious parties of Stuart times want correction (pp. 301, 353, 363), and it was not the Westminster Assembly which made the Solemn League and Covenant with the Scots (p. 360).

Readings in English History from Original Sources. Book II., 1155-1485. By R. B. Morgan and E. J. Bailey.

216 pp. (Blackie.) 2s. 6d.—We have previously recommended the first volume of this series. Extracts are here given from mediaeval chronicles, letters, &c. These are followed by an "analysis of sources," chief dates, and a list of tales illustrative of the period. There are also many good illustrations, photographic and others, with brief explanatory notes where necessary. A very good book.

The "Britannic" Historical Geography. Part i., 25 pp.; part ii., 25 pp. (Charles and Dible.) 3d. net each.—Each of these books consists of alternate pages, that on the left hand giving a summary of a period, that on the right containing clearly drawn outline maps illustrating the period, with only the names that refer to the period. They are very well done, and the price helps to make them eminently suitable as useful accompaniments to lessons on English history. We can very heartily recommend them.

The Byzantine Empire. By N. Jorga. viii+236 pp. (Dent.) 1s. net.—This book is a translation from the French by Mr. Allen H. Powles, and consists of a sketch of the history of the Eastern Roman Empire from the year 400 until the fall of Constantinople in 1453. There are also an epilogue, a bibliography, a chronology of the emperors, and a scanty index. The first sixty pages are hard reading, partly from the allusive style of the original (there is no explanation of many of the terms used), partly from the faults of the translation. Some sentences did not render any sense until one had turned them back into the French original. Later, the story appears to be smoother.

Voyages of the Elizabethan Seamen. Edited by E. J. Payne and C. R. Beazley. lxxii+415 pp. (Clarendon Press.) 4s. 6d.—This useful book consists of a general introduction on the work of the Elizabethan Seamen, and on the life and works of Hakluyt, followed by Captain John Smith's "Directions for taking a Prize." Then follow short chapters on Hawkins, Frobisher, Drake, and other sixteenth-century worthies, alternated with long extracts from the "Principal Navigations" of Hakluyt, all but one of which are not from his own pen. There are explanatory notes at the bottom of the pages, and elsewhere portraits of the heroes, and an index. The names of the editors are in themselves guarantees of the accuracy and thoroughness of the work. It should be in every school library, or at least should be quoted from in lessons on the period.

Tabulated Analysis of British History. 31 pp. (Oliver and Boyd.) 2d.—Lists of dates grouped under headings, divided, curiously enough, into "British History" and "Scottish History." The "terms" of Magna Charta are strangely misleading.

The Family. By H. Bosanquet. vii+344 pp. (Macmillan.) 8s. 6d. net.—To those who wish in an easy way to know some of the latest phases of the controversy as to the patriarchal theory of Sir Henry Maine, the first part of this work will be interesting and useful. The author traces the history of the family as an institution through the various ages of the world, regarded mainly from the economic point of view, and shows how and when the patriarchal family arose and flourished and passed away. In the second part she discusses the modern family, its constituent parts and its functions in the modern world. She has much to say on its relation to property, especially in land, and on the desirability of its mainten-

ance. Specially interesting to teachers should be the pages (in part ii., chapter xiii.) comparing and contrasting the work of the family and the school in the education of the child. There is no index.

Geography.

The Senior Geography. By A. J. and F. D. Herbertson. viii+263 pp. (Clarendon Press.) 2s. 6d.—This is the third book of the series "The Oxford Geographies," the other two volumes of which have been reviewed in former issues of THE SCHOOL WORLD. There is the same somewhat "stiff" reading, even though in this case meant for the use of the upper school, as we criticised in the preceding books. The same features, however, of which we approved are noticeable in this, especially the way in which the relation of cause and effect is continually insisted upon, and the lesson driven home by the frequent insertion of educative maps and plans and cross-sections. Subject-matter is well proportioned—an important point in a geography that treats of the whole world—though here and there are minor lapses; New Guinea, for instance, is treated to a whole page, while the Straits Settlements are barely alluded to. The sketch maps are *very* sketchy—none the worse for that; indeed, they induce, or suggest, blackboard work *ad lib.* for the teacher. Some of them are rather indistinct, and many of them are innocent of latitude and longitude (work for the blackboard again!), though all are provided with scales. There are full explanations of these maps, either in footnotes or in the text itself. They are eminently instructive, even if crude and inartistic. Perhaps the main feature of the book is the division of the world into *natural* regions. The headings of the various sections are: "The Mediterranean Region," "The Mountain Barrier North of the Mediterranean," "Central and North-West Europe," "Russian Lands," "The Mid-World Deserts," and so on. The Barbary States, therefore, are read in the same section with Italy and Asia Minor, the Sahara with Arabia, &c. This has long been Dr. Herbertson's favourite classification of world-geography, and is, in his opinion, far superior to that of the usual arrangement in *political* regions. It has, of course, its good points, which, indeed, are quite obvious. At the same time, the old classification is not to be decried off-hand. It appeals to the practical side of geography, and it is beloved of public examinations and school curricula. A very little trouble, however, will enable teachers who believe in the "Europe—Asia—Africa" order of things to fit this excellent work into the scheme of their lessons. They should read it themselves, anyhow. It does not profess to be elementary, but rather to carry the teaching up to the point at which university work may profitably be begun.

A Junior Physical Geography. By F. O. Williams. 63 pp.; diagrams and illustrations. (Philip.) 1s.—This book is designed for all intermediate and secondary schools, but primarily to meet the requirements of the Central Welsh Board for junior certificates. As the work has already been much better done in several well-known books, we presume that cheapness is the main *raison d'être* of the present essay. But really Mr. Williams should not have used a Mercator projection map to show the shape of the world's land masses.

Northumberland and Durham. Anon. 40 pp.; map and pictures. (Pitman.) Paper, 3d.; cloth, 4d.—This is one of Pitman's "Local Readers" in geography and history. The story of the two counties is told in simple language and prettily illustrated. More attention is given to the history than to the geography.

Sketch-map Geography: England and Wales. By George Carter. 29 pp.; maps. (Relfe.) 8d.—The author has already published a "Complete Geography of the World," from which this "sketch-map" is an extract. The main feature is a full-size map opposite each page of the text. The book can be recommended to those who require a lot of facts without much indication of cause and effect. The publishers claim that "no essential fact is omitted, only unimportant details are ignored." They might have added "and plenty of unessentials inserted."

Outline Elementary Atlas of Comparative Geography. (Philip.) 1s.—These thirty-two maps are outlines selected from the coloured plates of Philips' well-known school atlas. They are printed on drawing paper, and should afford good exercise in imitative colouring. Whether they will serve a useful geographical purpose or not depends upon the teacher and the way in which he allows his class to use them. We think the various outlines might have been simplified with advantage.

Mathematics.

An Elementary Treatise on Theoretical Mechanics. By J. H. Jeans. viii+364 pp. (Ginn.) 10s. 6d.—It is only in a somewhat restricted sense that this treatise can be called elementary, seeing that it includes a discussion of generalised co-ordinates. Its claim to be considered elementary rests upon the fact that no previous knowledge of mechanics is assumed on the part of the reader, and that in the earlier portions of the book little use is made of the calculus, and the range of mathematics needed for successful reading does not extend beyond what the schoolboy knows as the elements. The treatment of the subject differs very distinctly from that of the usual text-book; on the one hand it is not so full of practical applications and experimental results as to divert attention from the general principles that constitute the science of mechanics, while on the other hand it illustrates all the leading principles by carefully worked examples that will appeal to every intelligent student, whether he aims at becoming a practical engineer or desires only to fit himself for any profession in which a knowledge of the principles of mechanics is needed. The exposition is usually very lucid, and is not burdened with unnecessary mathematical details; yet the book needs concentrated attention to be thoroughly mastered, and, like every really good book, will require to be read and again read. A sufficiently large number of examples is provided for the student's practice; any student who can work through these will have acquired a sound and fairly extensive knowledge of mechanics. As a book for a university student or for anyone who wishes to gain a sound knowledge of theoretical mechanics, this treatise can be thoroughly recommended.

A Compendium of Spherical Astronomy with its Applications to the Determination and Reduction of Positions of the Fixed Stars. By Simon Newcomb. xviii+444 pp. (Macmillan.) 12s. 6d. net.—This volume is stated to be the first of a projected series having the double purpose of developing the elements of practical and theoretical astronomy for the special student of the subject, and of serving as a handbook of convenient reference for the use of the working astronomer in applying methods and formulæ. The book now issued is intended to serve the special object of explaining improved methods of deriving and reducing the positions and proper motions of the fixed stars; but it contains much valuable matter of a preliminary character such as an excellent discussion of the theory of errors of observation and the method of least squares, and a lucid

statement of the fundamental principles of spherical astronomy. In part iii. the central subject of treatment is dealt with in an exceedingly thoughtful and remarkably simple manner, with a fulness and precision that are hardly to be expected from the comparatively small space it occupies. The appendix provides an excellent series of tables.

Algebra for Secondary Schools. By Webster Wells. x+462+ (Answers) 51 pp. (Heath.) 5s.—This work does not seem to be differentiated in any important particular from various other text-books in common use, many, if not all, of the features mentioned in the preface being represented in the better classes of text-book. Allowance being made for this, one gladly recognises the merits of the work; the statement of the rules is clear and expressed in simple language, the illustrative examples are numerous and suitable, the order of topics is well adapted for the average pupil, and the standard of rigour in demonstration is on the whole good. A wise decision is, we think, shown in the rejection of certain proofs (while retaining the theorems) in cases involving infinite series; in fact, more omissions of this kind might have been made. The chapter on equivalent equations should, we think, be introduced at an earlier stage, and might well be enlarged; although too difficult in some parts for the beginner, yet a discussion on general lines is quite intelligible and affords excellent practice. The book is on the whole well adapted for schools, and the number of examples is so large that the pupil will require no additional assistance of that kind.

Graphs: or the Graphical Representation of Algebraic Functions. By C. H. French and G. Osborn. viii+128 pp. (Clive.) 1s. 6d. *Key to Graphs.* By F. Rosenberg. iv+128 pp. (Clive.)—The chief change in this (the second) edition consists in the addition of chapters on the application of graphs to arithmetical problems, harder graphs, and the slope of graphs. By these additions the book is made more suitable for certain types of student, though personally we rather dread the tendency to the excessive applications of graphical methods in arithmetic; some arithmetical problems are too apt to become mere puzzles when attempted graphically. From the algebraic standpoint, however, the book is well written, and gives quite enough both of solutions and of examples. The key will prove useful to students who have no teacher to guide them. In both books the lines of the diagrams seem to us to be too thick; surely there is no reason for making the axes so very heavy as they are in most of the diagrams, even in those that are used for the solution of equations.

Arithmetic: Chiefly Examples. By G. W. Palmer. x+339+ (Answers) xlvi pp. (Macmillan.) 3s. 6d.—As the title-page indicates, the contents of this book consist chiefly of examples, but many fully worked examples are given, and the practical hints contained in these cases are often very valuable. The book is intended to be used after a short course in some quite elementary text-book, and will probably be found to contain quite enough for the average pupil. The collection, so far as can be judged by inspection, strikes us as being unusually good; approximations receive great, but not too great, attention; graphical methods are confined within reasonable limits; logarithms and practical examples involving logarithmic calculations are included; and the subjects of interest, discount, shares and stocks receive good treatment. A decided improvement (which is really a return to an older practice) is the

inclusion of a compound interest table, as well as a table of four-figure logarithms. Altogether the collection well deserves the consideration of teachers.

Science and Technology.

Notes on the Life-History of British Flowering Plants. By Lord Avebury. 450 pp. (Macmillan.) 15s. net.—The outside of the book recalls the same author's "Scenery of England." Inside, the first impression is of an enlarged edition of that admirable little book, "British Wild Flowers considered in Relation to Insects," with contributions from the author's other works on seedlings, buds, stipules, flowers, fruits, and leaves. But this new book attempts a wider survey, a more catholic outlook. To the systematic botanist the characters of a plant are useful, because by them species are identified and distinguished. Lord Avebury proposes to begin where others have left off. To him the characters of a plant imply its relation and adjustment to the whole universe. In the introduction of forty-six pages are discussed such general topics as the relation of annuals and perennials to wet and dry soils, the sleep of flowers, arrangements in fours and fives, and the flanged girder theory of plant stems. The 400 remaining pages are a survey of British flowers. Under Ranunculaceæ most species are dismissed in about half a page each, but of Delphinium, Aconitum, and Aquilegia fuller details are given of the life-history of the flower, the species of insects attending it, and the manner of their access. The pollination of the flower is the dominant topic throughout the book; but the importance of the book lies in the recognition of the multitude of other relationships between plants and their environment. Thus under Berberis is discussed its relation as host to *Æcidium*, under *Nymphaea* its stomata, and turning the pages we read of the seed-dispersal of *Geranium*, the leaf-movements of *Oxalis*, the seedlings of *Ulex*, of parasitic mistletoe and insectivorous sundew—topics not all new, but here most conveniently accessible to the reader. The book is well illustrated, and a glossary of about one hundred words measures the author's freedom from obscure technical terms. His style is always terse and clear.

Heat, Light, and Sound. An Introductory Course of Practical Exercises. By J. R. Ashworth. 120 pp. (Whittaker.) 2s.—This is an excellent course of experimental work, suitable for junior students. The apparatus required is quite simple, yet sufficient to afford satisfactory results. Many of the experiments can be found in previous text-books; but this is no fault, since it is quite undesirable to introduce novel experiments solely on account of their novelty. Yet, in certain cases, Dr. Ashworth does good service in describing new methods in the simple treatment of difficult problems; we need only specify an experiment on the thermal conductivity of a solid. Would it not be better to use the terms "lower fixed point" and "higher fixed point" of a thermometer rather than the terms "freezing point" and "boiling point" on a thermometer, and to associate the latter terms only with the temperatures of solidification and vaporisation of liquids?

A Laboratory Course in Physics. By R. A. Millikan and H. G. Gale. 134 pp. (Ginn.) 2s.—This laboratory course is intended for the use of secondary schools. All branches of physics are covered; and the apparatus required is of a simple type. The authors maintain that the experiments do not presuppose any previous study of the subject; and they state that their students are neither

instructed nor advised to study their experiments before entering the laboratory, for each experiment has been arranged to carry with it its own introduction. Teachers will find several useful suggestions in the arrangement of apparatus, and it is satisfactory to find a sufficient treatment of the phenomena of fluid pressures. It is somewhat misleading to inform students that Ohm's law is $\frac{\text{volts}}{\text{ohms}} = \text{amperes}$, and British students may not realise that a nickel is an American coin.

Time and Clocks. By H. H. Cunynghame. 200 pp. (Constable.) 6s. net.—This book gives a popular account of time and its measurement. The ideas of space, mass, and gravity are rapidly explained, and an interesting account of the origin of the names of the days and accounting for the order in which they occur follows. Sundials are described, and an illustration is given of the mechanism of a water clock. Sand glasses and oil lamps as measurers of time are referred to, and a slight sketch is given of the ancient ideas of science—indicated by the Almagest, Dante's Hell, and Galileo's Dialogues. The isochronous swings of springs and pendulums leading to the verge escapement, Huyghens' clock, and the grandfather clock, form an interesting chapter. After a brief account of electric clocks and chronographs, the book ends with an appendix on the form of teeth of wheels. More details of curious clocks—even at the expense of some of the "mechanics"—would add to the charm of the volume. On p. 33 there is a slip, "north pole" for "north pole of the heavens"; a letter is missing in Fig. 53; and the explanation of the method of finding longitude (p. 164) is not free from difficulty. At a somewhat reduced price, the book would be one to recommend as valuable to boys.

Technical Electricity. By H. T. Davidge and R. W. Hutchinson. 502 pp. (Clive.) 4s. 6d.—The authors offer this volume as a somewhat unusual combination of scientific principles and engineering practice; they intend it to give the reader a thorough working acquaintance with practical electrical engineering, and with knowledge based upon sound scientific principles. In all this the authors are successful. The various parts are devoted to dynamical definitions and units, electrostatics, magnetism, and current electricity. The last part is treated, of course, with far more fulness than the earlier parts, and occupies about three-fourths of the book. The authors have assumed no previous knowledge on the part of the reader, and the subject-matter is necessarily condensed. So concentrated is the treatment, that the young beginner would probably find difficulty in reading the book intelligently. We can strongly recommend it to those students of practical electrical engineering who have passed through a preliminary course of elementary magnetism and electricity, and also through a course of mathematics, including trigonometry.

Art.

Practical Wood Carving. By Eleanor Rowe. 213 pp.; 169 illustrations. (Batsford.) 7s. 6d. net.—Miss Eleanor Rowe, whose "hints" on wood-carving and chip-carving have already enjoyed wide and well-deserved popularity, now gives us the benefit of her wide experience in the more elaborate and comprehensive form of "Practical Wood Carving." Miss Rowe hopes that her book will appeal to the student, who will find therein all the information requisite for beginning his studies; to the carver and teacher, who will find inspiration and sugges-

tions for further development; to the designer, who, by gaining some acquaintance with the practical details of the craft, will better understand what effects may be readily obtained and what are difficult and inappropriate; and to the architect, who may be encouraged to include more carving in his buildings. That the book will appeal strongly to all who are interested in the subject there is no doubt whatever; we would go further, and say deliberately that no one who, directly or indirectly, either as craftsman or connoisseur, is interested in wood-carving, can afford to be without it. The volume is profusely and handsomely illustrated, and abounds with numerous "dicta" born of long experience and ripe judgment. With a copious index and glossary, and a chronological table of styles, this handsome book takes its place at once as a standard work on the art of wood-carving.

Embroidery and Tapestry Weaving. By Mrs. A. H. Christie. 400 pp. (John Hogg.) 6s. 6d. net.—If, as the author suggests, every woman is at heart a sempstress, to whom dexterity with the needle comes as a natural inheritance, then Mrs. Christie's book on "Embroidery and Tapestry Weaving" will appeal to a very large circle of readers; that it cannot but be read with profit and delight is evident. This volume forms the latest of the "Artistic Crafts Series of Technical Handbooks," edited by Prof. Lethaby (who contributes a brief historical account of the art of embroidery by way of introduction), and may be cordially recommended to art mistresses and sewing mistresses of girls' schools, who will find it a storehouse of information and inspiration on sound artistic lines. Mrs. Christie is entitled, by virtue of her position at the Royal School of Art Needlework, to speak with authority on all the various branches of this subject, and has drawn largely on the vast resources of our museums and churches for specimens of work wherewith to illustrate her remarks; the result is an extremely interesting and eminently readable volume, full of practical information for either novice or expert.

Drawing of Foliage and Foliated Design. By J. Carroll. 48 plates. (Burns and Oates.) 2s. 6d.—This publication consists of twenty-four plates of photographs of growing plants and flowers, interleaved with designs based on the various flowers. The natural specimens selected for representation have evidently been chosen with considerable care and judgment, whilst the skill shown in their arrangement in such a manner as to emphasise their characteristic features and lines of growth, without any distortion or loss of freedom, calls for the highest praise. In the drawing of foliage, either from photographs or from nature, the student's chief difficulty is generally "how to begin"; in this connection the supplementary sketches suggesting methods of procedure are entirely admirable, and should prove very helpful to the student. The *raison d'être* of the designs is a little difficult to understand. If they are intended as a course of instruction in the art of designing, one fears that the youthful would-be designer's ideas on the subject will be in a somewhat chaotic state at the end of the course, the impression gathered from these plates being that, to make a design, one must take a spray or plant, symmetrise it, then let it meander round in a weird, fantastic manner until it completely fills the space to be decorated. Taken individually, the designs vary considerably in merit, but we are decidedly of opinion that their inclusion mars an otherwise excellent scheme of work.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Pronunciation of Latin.

I SEE a few of the old bugbears raise their heads once more in the letter of "J. O'H. P." in the July number of THE SCHOOL WORLD. Let me offer a word in reply.

Reformed pronunciation does not "aim at the impossible," i.e., the recovery of the exact intonation of every phrase. It aims at reproducing both quantity and quality of the ancient vowels, and the quality of the consonants; this can be done, because we have abundant evidence to go upon. It is quite easy to do if begun at the beginning; and since the English vowels are degraded in sound, even on educated lips, this is an essential thing if there is to be any beauty in the sound of the Latin language. We think that half a loaf is better than no bread. We hope, moreover, that the training in producing sounds given thus will react on the speaking of English; anything that helps to make the organs of speech flexible is good. A new pronunciation does not, in my experience, "discourage young boys."

The second objection is based on a double mistake. First, the objectors have mistaken spelling for sound. Because *civil* looks to the eye like *civis*, they forget that, even according to their own pronunciation, one is *sivil*, the other *sigh-vis* (I shrink from a phonetic transcript, lest I raise a new bugbear). So with *national* and *nation*, and many others. From the sounds no one would suspect a connection; and the spelling, which does suggest it, remains the same, anyhow. The second mistake is to suppose that the class of words in question comes from the Latin. It does not; it comes from the French. Therefore a pronunciation which suggests a direct derivation from Latin is faulty; and that which we recommend, which more resembles French, is correct in its suggestion.

The next paragraph of our critic I confess I do not understand. The reformed pronunciation is condemned because it "classes Latin with modern languages"—I suppose the critic means modern foreign languages—and a pronunciation is recommended which classes Latin with English, although English is a modern language, and the "whole habit of mind involved in the study of Latin" is just as much "at variance" with English as with French or German. The critic goes on to assume that those who use a reformed pronunciation are more likely to make "flying shots" than others. He gives no evidence for this assumption. I have seen "flying shots" made in written unseens which could hardly be surpassed in any method of pronunciation; e.g., "The oysters sang sweetly in the trees." Nor is there evidence given for the next statement, that, where Latin is spoken, there are "more striking examples of bad syntax, bad grammar, and bad paraphrase," than where it is not; and this statement, if true, has no bearing on the question with what pronunciation Latin should be spoken. I do not think that there is evidence for a generalisation on the effect of spoken Latin at present: these effects are only known to those who have tried, and imagined by those who have not.

The last sentence, no doubt, contains the pith of the letter. The schoolmaster is shocked at having to "change his old methods for new." The schoolmaster is shocked at the idea of learning. He has my sincerest sympathy.

Perse School, Cambridge.

W. H. D. ROUSE.

Terrestrial Globes used as Sundials.

TEACHERS of geography may be interested in the terrestrial globe shown in the accompanying illustration, and the instructive exercises which may be performed with it. The globe is mounted so that it can be adjusted with the axis parallel to the earth's axis, by making the angle between the axis and the base equal to the latitude of the place of observation. When adjusted in this way, the globe is in the same position with regard to the sun that the earth is in space. If the globe is fixed so that the Greenwich meridian is in a north and south plane, the sun will be over this line at twelve noon. In the mornings the sun is over meridians east of that of Greenwich, and in the afternoon it is over meridians west of Greenwich.

A brass half-meridian can be moved around the globe to follow the sun. To find apparent time, this half-meridian is turned until the shadow is narrowest; and the hour crossed by this shadow can then be seen by the clock figures on the equator. A cross-piece which slides on the half-meridian can be adjusted so that it is also under the sun. The point where the shadows of the half-



meridian and cross-piece intersect marks the point of the earth where the sun is exactly overhead at the instant of observation. The globe thus shows at any time when the sun is shining (1) the parts of the earth where it is noon, and also where it is day and night; (2) the apparent time at the place of observation; (3) the point where the sun is exactly overhead; (4) the limits of the tropics where the sun can be overhead, from $23\frac{1}{2}$ degrees north latitude to $23\frac{1}{2}$ degrees south latitude.

Any terrestrial globe having a means of adjusting the axis at the right inclination for the place of observation can, of course, be used in the same way by fixing it so that the Greenwich meridian is in a north and south plane. At any instant when the sun is shining, the illuminated half of the globe will then show the hemisphere which is in daylight, while the dark half will show where it is night. To use such a globe as a sundial, however, it is necessary to have a means of finding the meridian over which the sun is shining at the time of observation, and its distance, in time or angle, from the Greenwich meridian.

The globe here shown was made for me by Messrs. Newton and Co., 3, Fleet Street, London, E.C. I am

trying to get a terrestrial globe made in pottery or other material which will stand the weather, so that it can be fixed out of doors in the manner described, and can be used to indicate apparent time. In an ordinary sundial, the style is fixed and the moving shadow shows the hour on the dial; with a globe and a movable half-meridian, the apparent time can be found by bringing the half-meridian directly under the sun.

It may be objected that a globe fixed as suggested, and used to show where day and night exist at different hours and seasons, will give the erroneous impression that the sun actually revolves around the earth once in twenty-four hours. I consider, however, that it is far more important to have clear ideas of the apparent movements of the sun during the day and year than it is to accept the dogmatic statement that these movements are due to the earth's rotation and revolution. So far as geographical conditions are concerned, precisely the same phenomena would be produced if the sun really revolved around the earth once a day and moved through the ecliptic once a year, instead of the earth rotating on its axis and revolving around the sun.

R. A. GREGORY.

Low-Pressure Sensitive Flames.

THE best form of sensitive flame is undoubtedly that used by Tyndall, burning gas under a pressure of 10 inches or so of water; but there are occasions when high-pressure gas is not at command. It may therefore be of service to describe some observations lately made in connection with sensitive flames burning low-pressure gas from the mains.

The well-known low-pressure sensitive flame of Govi and Barry has the defect that it is practically invisible. The roaring of the flame when it is excited is apt to be masked by the sound of the whistle or bird-call used to excite it. What is wanted for demonstration purposes is a luminous sensitive flame. I am aware that so far back as 1867 Mr. Barrett described a low-pressure flame of this type in vol. xxxiii. of the *Phil. Mag.*, but I do not find his V-shaped aperture easy to make. With scissors, as recommended, I quite failed to get satisfactory results, and when the V notch is filed my experience has been that the jet is very apt to crack or splinter in use. Moreover, the flame requires for its satisfactory working a gas pressure of more than 3 inches of water.

Fig. 1 represents a modification of the sensitive flame which I have found well adapted for demonstration purposes. The brass tube B is fitted with a pin-hole burner of $1/28$ -inch aperture. To the sliding ferrule F a small cup C is attached by means of the wire arm A, so that the height of the cup above the burner may be adjusted, and at the same time the cup may be rotated round the axis of B. The cup consists of a piece of aluminium tubing $1\frac{1}{4}$ inches in diameter and $1\frac{1}{4}$ inches deep. The base of the cup consists of copper gauze, 28 meshes to the inch. When the distance between the burner and the gauze is about 1 inch, it will be found that on slowly rotating the ferrule round the tube B the brightly luminous flame splits into two smaller divergent ones in certain positions of the cup (X, X in Fig. 1). The gas should now be turned on until the forked flame shows signs of instability. This requires a gas pressure of about $1\frac{1}{2}$ inches of water. When in this condition a shrill note causes the forks to jump together into a single luminous tongue of flame (shown in dotted outline in the figure). This flame is affected at great distances by the higher yet still audible notes of a Galton's whistle; but the decisive range of a bird-call is about 2 metres. Beyond this distance the bird-call just fails to make the flames X, X

coalesce completely, though they still jump towards one another quite perceptibly. Sound shadows thrown by a board about 9 inches square can be strikingly demonstrated with this flame, using as exciter a bird-call at a distance from the flame of about 30 cm. The flame seems to respond equally well whether the forks are edge on or broadside on to the source of sound.

Fig. 2 illustrates another modification of the sensitive flame. A glass jet J drawn out to an aperture of $1/20$ inch is mounted so that it can be raised, lowered, or rotated round the axis of the arm A. (To secure these motions it may be passed through a cork C, through which also passes the tube S with sprung ends.) G is a disc of gauze, 28 meshes to the inch and $2\frac{1}{2}$ inches in diameter. P is a pilot jet which passes through a small tight-fitting hole in the gauze and terminates just flush with the level of the gauze in a small aperture, the exact size of which is not of importance. The height of J is

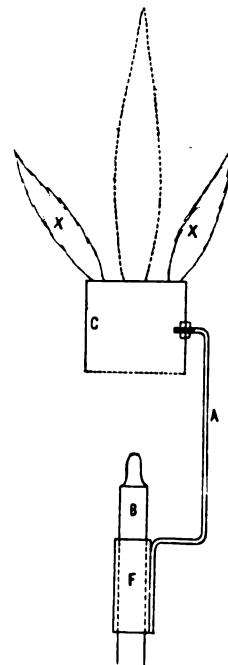


FIG. 1.

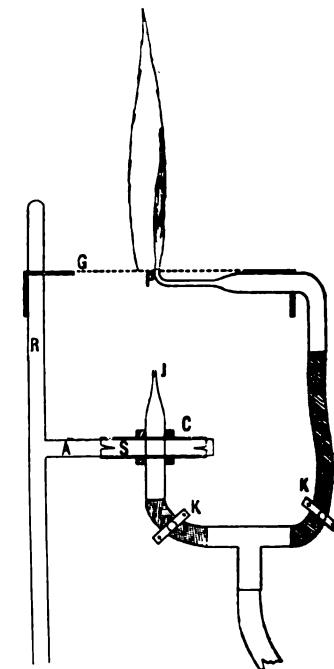


FIG. 2.

adjusted until its flame when lighted above the gauze is non-luminous and on the point of roaring, and by manipulation of the tube S its position on the gauze so arranged that its edge just meets the luminous flame from the pilot jet. The combined flame formed by the union of those from J and P is non-luminous by reason of the excess of air dragged up by the rush of gas from J. When a shrill sound is made the flame ducks down, and the gas from the pilot jet burns with a very bright yellow light. This form of flame is more sensitive than that first described, though I do not regard it as being so well adapted for lecture demonstration. The gas pressure required is just under 3 inches of water.

There is still a third simple modification of the luminous sensitive flame which requires rather less gas pressure than the one just described. A 2-inch disc of fine wire gauze—125 meshes to the inch—is fastened to a ring of asbestos board which supports a talc chimney 6 inches high and 2 inches wide. A thin-walled glass jet with an aperture of $1/30$ inch is adjusted until the flame is on the point of roaring, the chimney being removed during the

adjustment. This will require some $\frac{1}{2}$ inches of gas pressure. The chimney is then put in position in its asbestos ring. The flame is almost without luminosity, but when excited by a shrill sound it assumes the form of a luminous, writhing ribbon, which curls up a full inch above the chimney top. This flame, though much longer than either of the two previously described, has not their intrinsic brightness.

It does not seem to be recognised by purveyors of apparatus that a certain proportionality between the jet aperture and the mesh of the wire gauze must be observed in order to obtain a satisfactory sensitive flame; for I have by me a so-called sensitive flame burner, purchased from a leading firm of scientific instrument makers, in which this proportionality is so totally disregarded that the burner is nothing more than a laboratory ornament in lacquered brass.

DOUGLAS CARNEGIE.

Apparatus for the Determination of some Chemical Equivalents.

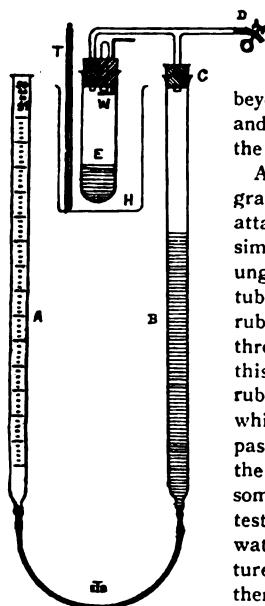
THE following description of a modified form of Hempel's burette may prove useful in school chemical laboratories for the determination of the equivalents of zinc, magnesium, and aluminium. This apparatus saves time in manipulation, for when once set up it is easy to determine the three equivalents quickly

with little further trouble beyond the introduction of the metal and the subsequent adjustment of the levels of the water.

A is a 50 c.c. pinch-cock burette graduated in tenths of a c.c., and is attached by rubber tubing to a similar, though somewhat wider, ungraduated glass tube B. This tube is fitted at C with an india-rubber cork through which passes a three-way tube. One passage of this tube terminates in a piece of rubber tubing and pinch-cock at D, whilst the other end of the tube passes through the cork fitted into the wide test-tube E, which contains some strong hydrochloric acid. This test-tube is placed in the beaker of water H so as to keep the temperature of the gas evolved constant. A thermometer T indicates the temperature of the bath. A piece of

glass tube, sealed at the top end, is fitted through the cork in the test-tube, and close to this glass tube a piece of copper wire, flattened at the bottom end, runs through the cork. This piece of wire W acts as a trap to the weighed metal placed in the short piece of sealed tube.

A determination is carried out in the following manner: The piece of weighed metal is placed in the short sealed tube and the copper wire turned round so as to prevent the metal from dropping out. The test-tube is fitted on, and the beaker of water brought up into position. The pinch-cock at D is opened, and the graduated tube A (which must be the movable one) is raised or lowered until the level of the water in it is nearly at the bottom graduation. The pinch-cock is now closed, and the final adjustment made by placing the graduated tube against the ungraduated one, and taking the reading when the level of the water in each tube is the same. Now turn the copper wire round so that the metal falls into the acid. The hydrogen liberated forces the water down in B and up



into A. It is important that, whilst this is taking place, the levels of the two columns of water should be kept about the same by lowering A as the volume of gas increases in B. This prevents undue pressure. Finally, the levels of the water are adjusted, and the height of the water in A is again read off simultaneously with the temperature indicated by the thermometer. The difference in the two readings of the burette is the volume of hydrogen evolved at the temperature and pressure of the laboratory. The height of the barometer at the time of the experiment must also be noted.

It is highly important to note that this apparatus *may not* be used for the determination of the equivalent of sodium by its action on water. To do so would inevitably lead to a serious explosion, on account of the explosive mixture which would collect in E being fired by the small scintillations which sometimes accompany the action of sodium on water. The apparatus for the sodium determination has already been described in THE SCHOOL WORLD for August, 1906.

The following are actual records of experiments carried out by means of this apparatus in the school laboratory; and since the determinations were made one after the other, the barometric height and temperature are the same in each case. This fact saves much calculation:

Equivalent of Aluminium.

Weight of aluminium	= 0.33 gram.
Volume of hydrogen evolved	= 45.1 c.c.
Temperature , , ,	= 13° C.
Height of barometer	= 734.5 mm.
Pressure of water vapour at 13° C.	= 11.1 mm.
. . . True pressure on the hydrogen	= 734.5 - 11.1 = 723.4 mm.
The volume of the hydrogen at N.T.P. would be	

$$45.1 \times \frac{273}{286} \times \frac{723.4}{760}$$

log 45.1 = 1.6542	log 286 = 2.4564
log 273 = 2.4362	log 760 = 2.8808
log 723.4 = 2.8593	

$$\frac{6.9497}{5.3372} = 1.3372$$

$$1.6125 = \log 40.98$$

40.98 c.c. of hydrogen at N.T.P. weigh $40.98 \times 0.00009 = 0.003688$ gram.
0.003688 gram of hydrogen is liberated by 0.33 gram of aluminium.

. . . 1 gram of hydrogen is liberated by $\frac{0.033}{0.003688}$ gram of aluminium.
= 8.95 nearly.

Equivalent of Magnesium.

Weight of magnesium	= 0.046 gram.
Volume of hydrogen evolved	= 45.9 c.c.
The volume of the hydrogen at N.T.P. would be	

$$45.9 \times \frac{273}{286} \times \frac{723.4}{760} = 41.70 \text{ c.c.}$$

41.70 c.c. of hydrogen at N.T.P. weigh $41.70 \times 0.00009 = 0.003753$ gram.

. . . 1 gram of hydrogen is liberated by $\frac{0.046}{0.003753}$ gram of magnesium.
= 12.26 nearly.

Equivalent of Zinc.

Weight of zinc	= 0.113 gram.
Volume of hydrogen evolved	= 42.3 c.c.
The volume of hydrogen at N.T.P. would be	

$$42.3 \times \frac{273}{286} \times \frac{723.4}{760} = 38.42 \text{ c.c.}$$

38.42 c.c. of hydrogen at N.T.P. weighs $38.42 \times 0.00009 = 0.003458$ gram.

. . . 1 gram of hydrogen is liberated by $\frac{0.113}{0.003458}$ gram of zinc.
= 32.68 nearly.

Magnesium in the form of ribbon, aluminium wire, and zinc foil have been found to give good results. A certain amount of insoluble impurities will be found present in the zinc foil, and remains behind as a black residue after treatment with acid. The percentage weight of the impurities may be estimated separately with a larger amount of zinc, say 5 grams, and an allowance made for the weight of impurities in the zinc taken for an actual equivalent determination.

E. T. BUCKNELL.

St. Philip's Grammar School and the Oratory School,
Edgbaston, Birmingham.

SINCE writing this description, I have been kindly informed by Mr. E. Lewis, Oundle School (to whom I am much obliged), that the method described above is also advantageously applicable to the determination of the equivalent of calcium metal (using water with the merest trace of hydrochloric acid in the large test-tube instead of strong hydrochloric acid), and that good results are thereby obtained. The metal can be procured nearly pure, and at a price which does not prohibit its general use (about 1s. 3d. per oz.).

E. T. B.

A New System of School Examination.

MAY I direct the attention of your readers to a new system of conducting school examinations? Although opinion about examinations in general is undergoing a considerable change, and their value is being discounted by many, they still remain with us as a necessary evil, so that it appears to me advisable to consider any changes they may be undergoing.

Leeds and Bristol Grammar Schools have come to an arrangement this year by which the staff of the one school examines the boys of the other, and *vice versa*. The advantages of an innovation of this kind are many, and the drawbacks appear to be few.

The first benefit to be derived is that of the interchange of ideas. The staff of one school will get an insight into the lines upon which the staff of another is working. Take a case in point. Science and modern language masters have to be exchanged for practical and oral work respectively. Examinations in these subjects, as in others, are then not only useful as an incentive to the boy, but also as means of instruction to the teacher.

Secondly, if this system was adopted it would do away, to a great extent, with outside examiners, who often perform their work after the manner of inspectors. Schoolmasters know the difficulties they have to cope with, and are more capable of being thorough in judging the merits and demerits of masters' and boys' work than those who sometimes are only indirectly connected with the scholastic profession and sometimes even not at all. Fault-finding is not likely to gain the upper hand with teachers. They will, at any rate, not set out with the main object in view of finding out what the boys do not know, but rather try to discover what they do.

Lastly, from a monetary point of view, the new method has much in its favour. Where money is allotted for examination purposes it should surely find its way into the pockets of underpaid schoolmasters rather than into those of men who could, in many cases, very well do without it.

In short, whether it be an improvement or otherwise, this fresh departure in examinations might be watched with interest, as should it gain a firm foothold it may be expected to spread rapidly, and perhaps ultimately to become general.

Bristol Grammar School.

A. B. YOUNG.

The Approach to Linear and Quadratic Equations.

I HAVE read Mr. Child's suggestive article on the "Approach to Linear and Quadratic Equations" with much interest.

A boy appreciates that it is a very short step from the factorisation of the quadratic function to the solution of the quadratic equation.

Even when we approach the solution of quadratics with irrational and imaginary roots, my experience has taught me that it is well to discard the "ordinary method of solution by forming the numerical square on the right-hand side of the equation," and to employ generally the one method.

Having factorised functions of x of the form x^2+bx+c , the solution of the quadratic follows at once; thus:

$$\begin{array}{ll} 5x^2 - 2x - 8 = 0 & 5x^2 + 2x + 8 = 0 \\ i.e. x^2 - \frac{2}{5}x - \frac{8}{5} = 0 & i.e. x^2 + \frac{2}{5}x + \frac{8}{5} = 0 \\ i.e. x^2 - \frac{2}{5}x + (-\frac{1}{5})^2 - \frac{1}{5} - \frac{8}{5} = 0 & i.e. x^2 + \frac{2}{5}x + (\frac{1}{5})^2 - \frac{1}{5} + \frac{8}{5} = 0 \\ i.e. (x - \frac{1}{5})^2 - \frac{(-41)}{5} = 0 & i.e. (x + \frac{1}{5})^2 - \frac{(\sqrt{-39})^2}{5} = 0 \\ i.e. (x - \frac{1}{5} - \frac{\sqrt{41}}{5})(x - \frac{1}{5} + \frac{\sqrt{41}}{5}) = 0 & i.e. (x + \frac{1}{5} - \frac{\sqrt{-39}}{5})(x + \frac{1}{5} + \frac{\sqrt{-39}}{5}) = 0 \\ \text{Hence, } x = \frac{1}{5}(\pm \sqrt{41}). & \text{Hence, } x = -\frac{1}{5}(\pm \sqrt{-39}). \end{array}$$

W.M. T. CLARKE.

The Secondary School, Heanor.

The Teaching of English in Schools.

My attention has been very courteously directed to some recent alterations in the Cambridge Local examinations which had escaped my notice when I wrote the article on "The Teaching of English" which appeared in your July issue. In both junior and senior examinations it is now open to schools to offer—in place of one set book carefully prepared—two or three books, which will be examined by "a paper of questions of a general, not a detailed, character." The papers of this type set in the examination held last December seem to me excellent. Senior candidates may take, as an alternative to this paper, "a paper of easy questions testing the candidates' general knowledge of English literature not earlier than 1579." Two wise additions to the notice go far to discourage the wrong sort of teaching and study to which papers on literary history so often lead: "Candidates will not be expected to show acquaintance with minor authors or biographical details," and "the questions will not be limited to text-book knowledge." The paper on English grammar has been discontinued in the senior examination; and the composition papers are not confined to alternative subjects for an essay, but include also questions which test a candidate's vocabulary and knowledge of correct idiom. All these changes make the way easier towards a general improvement in the teaching of this subject.

J. H. FOWLER.

Clifton College, Bristol.

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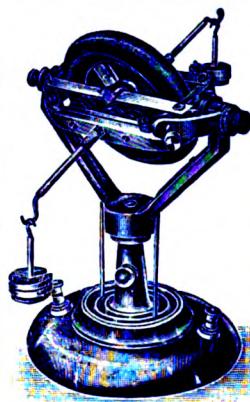
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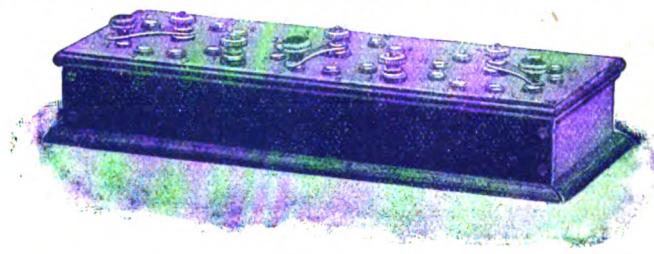
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SIXPENCE.

THE ENGLISH SCHOLARSHIP SYSTEM: ITS PRINCIPLES AND RESULTS.¹

By Prof. M. E. SADLER, LL.D.
and

H. BOMPAS SMITH, M.A.

Headmaster of King Edward VII. School, Lytham.

THE paper of which this is a summary is the outcome of an inquiry conducted by the authors in different parts of England during the summer of 1907, with the help of officers of local education authorities and of headmasters, headmistresses, and other teachers in elementary and secondary schools.

Altogether more than four hundred and fifty communications, oral and written, were received, and the authors are much indebted to their informants for the great amount of trouble taken in supplying information.

The scholarship system is a distinctive mark of English education. Its beginnings date from the Middle Ages. Its modern developments are connected with the growth of competitive examinations, upon which it largely depends. There has always been in England a readiness to help forward youths of exceptional promise to intellectual opportunities appropriate to their powers. But there has also been a great reluctance to place secondary and higher education under the direct control of the State, and consequently a preference for a variety of semi-independent schools representing different social traditions and points of view. These two facts in combination resulted in the scholarship system, to which in the mid-Victorian era the general belief in the benefit of open competition gave a wider vogue. During the last generation, however, new forces have subjected English educational arrangements to a heavy strain. Improved higher education had become on civic and economic grounds a national necessity. New sections of the community were demanding access to secondary schools. It became necessary, therefore, either to extend the scholarship system or to embark upon a policy of free, or nearly free, secondary and higher education in institutions under direct public control. The latter policy would have been wasteful of existing educational resources. Nor is the

remission of school fees sufficient by itself to enable the poorest scholars to postpone the time of their entrance into wage-earning occupations. Maintenance allowances are also necessary. The scholarship policy has enabled the local authorities established under the Education Act of 1902 to meet in the quickest and most economical manner the demand for extended facilities for secondary education, a demand accelerated by new Government regulations for the training of pupil teachers. The fact that many of their pupils pay fees has enabled the secondary schools to carry on their work with less public aid than would otherwise have been necessary, and more public money has thus been made available for maintenance allowances. Thus through the rapid extension of the scholarship system, which links together schools of different types under the general supervision of public authority, much has been done within the last five years to construct a framework of national education.

The five chief branches of the English scholarship system are :

- (1) Scholarships tenable at universities or other places of advanced education.
- (2) Scholarships tenable at the great secondary boarding schools ("public schools").
- (3) Junior scholarships from the public elementary schools to the secondary day schools.
- (4) Intermediate scholarships enabling pupils to prolong their secondary education.
- (5) Scholarships tenable at evening schools and classes.

The new regulations for the payment of Government grants to secondary schools may greatly affect the present situation. But the scholarship system has, at any rate, served as a useful expedient in a time of rapid social change. There is some reason to think that the offer of junior scholarships has been too profuse. Improvements in the elementary and secondary schools themselves are far more important than an indefinite increase of facilities for the transference of children from the one to the other.

The great diversity of the conditions and of the methods of administration in different areas prevents any generalisations as to the working of the scholarship system from being universally applicable, but the following have been the chief results

¹ From a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

of the system as it has developed in England during recent years :

(1) The scholarship system has made the English universities, old and new, the educational goal of hundreds of students of good ability who under former conditions would have been shut out from academic studies.

(2) Many boys and some girls of exceptional ability have been helped forward to high academic distinction.

(3) A large number of boys and girls from public elementary schools have been enabled by means of scholarships to obtain access to secondary schools. This has been especially the case during the last five years, in consequence of the operation of the Education Act, 1902, and the requirements of the new regulations for the training of pupil teachers. In the year 1906 nearly 12,000 scholarships and bursaries were awarded by local education authorities to enable children to pass from primary to secondary schools. Of these rather more than 5,000 were confined to boys, about 4,600 to girls, and the remainder were open to boys and girls on equal terms. Assuming that on an average these scholarships were tenable for three years, this would give a total of 36,000 scholarships running concurrently. Besides these general scholarships there were awarded in the same year rather more than 10,000 scholarships and bursaries confined to intending pupil teachers. Of these, 1,787 were for boys, and 4,915 for girls. In some areas the number of entrance scholarships to secondary schools is very large. In London about 2,000 are given annually, and in the Isle of Wight one such scholarship is given for every forty children in attendance at the primary schools. Besides these so-called junior scholarships, a number of intermediate and senior scholarships are also given. The total amount spent annually by local education authorities on junior and pupil-teacher scholarships is apparently rather more than half a million.

(4) In some cases the provision of junior scholarships of small value has been in excess of the needs of the situation. Thus, of the 12,000 junior scholarships just mentioned, more than a quarter are of the nominal value of £3 or less, and about 2,500 are valued at £2 or less. With this has occasionally gone a tendency to fail in giving sufficiently prolonged or ample help to the handful of pupils who show very marked ability or promise. There is a lack of scholarships by which children of small means might be enabled to go to first-grade secondary schools, and many more intermediate and secondary scholarships are needed. Our information is incomplete, but so far as it goes it tends to show that, excluding pupil-teacher scholarships, the number of intermediate scholarships is only 4 per cent., and of senior scholarships only 3 per cent., of the number of junior scholarships. To secure for large numbers of children of average powers a somewhat longer education than they would otherwise have received is an excellent object, if the education so given is appropriate to the children's

needs. But a scholarship system may in the long run prove socially deleterious if it gives brief but widespread encouragement to merely average ability without at the same time taking special pains to secure the opportunity of long and thorough training for carefully selected individuals of unusual capacity. And a scholarship system is economically vicious if it imposes a disproportionate share of the burden of taxation upon cultivated families with slender incomes, without at the same time providing for such families educational opportunities of an intellectual quality appropriate to their needs.

(5) To a limited extent scholarships have bridged over the gulf between lower and higher secondary education, a gulf which in England is social as well as intellectual.

(6) The scholarship system has virtually failed to span the gap between the public elementary schools and the great public (boarding) schools. The latter are mainly fed from a special type of preparatory school. But many clever boys whose parents can give them the intellectual preparation afforded by such preparatory schools are enabled by scholarships to obtain a public-school education at a greatly reduced cost. And it appears that, in the majority of cases, these boys could not be sent to public schools of this kind without such pecuniary help.

(7) A lop-sided development has recently been given to the scholarship system through the administrative need of securing large numbers of recruits (chiefly girls) for the elementary-school teaching profession. Apart from this, the claims of girls are as yet less liberally recognised than those of boys.

(8) The records kept of the later careers of scholarship-holders are at present inadequate. Such evidence as is forthcoming points to the conclusion that an overwhelming majority pass into literary, clerical, and other non-industrial callings. We have records of the after careers of 763 boys who were junior scholarship holders in Staffordshire, Lancashire, Leicestershire, or Somerset. Of these, between 8 and 9 per cent. went to some university; 17 per cent. became teachers, nearly all in primary schools; 6 per cent. entered the Civil Service; rather more than 40 per cent. became clerks or went into business; and less than 3 per cent. became engineers. Much further information is necessary before any definite conclusions can be drawn, but these figures would suggest that the scholarship system, as at present organised, fails to select and reward a due proportion of boys and girls whose abilities are practical and constructive rather than literary or purely scientific.

(9) A chief motive in the English scholarship system has been the benevolent desire to give every clever boy (and, more recently, clever girls) a chance of individual advancement through higher education. But less thought seems to have been given to the practical question, What kind of secondary and higher education is best suited to the special aptitudes of each individual scholar-

ship-winner? As the dominant tradition in the older form of secondary education for boys has been fixed by the requirements of literary callings, many of the secondary schools which are justly held in high esteem are not necessarily in a position to give the most suitable training to all the pupils for whom a slightly prolonged education is now desired. The experience gained through the working of the present scholarship system is revealing the lack of adjustment between some traditional courses of study and the intellectual and social needs of modern life. To remedy this defect new types of secondary-school curriculum are needed.

(10) The scholarship question should be looked at from a national point of view, not only from the standpoint of the personal advantage and preferment of the individual scholar. The fundamental purpose of a scholarship system in all its grades and branches is the direction of ability towards those callings in which the individual scholars are best qualified, by natural aptitude and by physical stamina, to render valuable service to the nation. But hitherto there has been some tendency to give preferential treatment to the recruiting of the more literary professions.

(11) The English scholarship system has worked fairly well in a rough sort of way during a period of rapid social change and of resulting educational development. But in itself it is no sufficient substitute for a coherent system of higher education, intellectually efficient in all its grades and practically adjusted to the needs of a modern community.

REFORMS NEEDED.

(i) Our fundamental needs are the reform of the elementary schools, both in town and country, and the provision of new types of secondary-school curriculum. The conditions under which the vast majority of English elementary-school teachers are at present obliged to work prevent them from giving a sufficiently individualised training, moral and intellectual, to the children committed to their care. The improvement of the elementary school will secure for the children the kind of early training which will best enable the more promising of them to take advantage of advanced courses of study. It will also tend to lessen the social cleavage which at present destroys the unity of English education in its elementary stage. But any effective improvement will be very costly and necessarily slow in operation. The necessary counterpart of the reform of the elementary school will be the increased differentiation of the secondary schools, and the better adaptation of their curricula to modern needs. Nearly all the secondary day schools in England need more generous financial assistance in order to attain a new measure of intellectual efficiency.

(ii) The English scholarship system in its present form gives special advantage to urban districts. It fails adequately to meet the needs of promising children living in the country. These are often prevented by distance or expense from gaining access to a secondary school. In some

cases more boarding scholarships are needed. Secondary "tops" should be added to some centrally situated rural elementary schools.

(iii) Much more should be done to provide higher secondary education of first-rate quality in day schools in many smaller towns. There is a danger of higher secondary education becoming (outside a few favoured centres) the privilege of the well-to-do. The new Regulations for Secondary Schools increase this danger. Government grants at a considerably higher rate are needed for higher secondary schools, and in aid of higher secondary "tops" in other carefully selected secondary schools.

(iv) There is need for a more generous provision of intermediate and higher scholarships to enable pupils of special ability to complete the full course at a higher secondary school or to proceed to an institution of university rank or of advanced professional training. For girls especially more higher scholarships are required, tenable at a variety of institutions for academic or practical study.

(v) The fixed value of the scholarships awarded by open competition at the public schools and universities might well be reduced. Ample supplementary allowances should be given to those scholars who need them, after private inquiry into the circumstances of each case.

(vi) Methods of selection which set a premium upon cramming and lead to the neglect of the candidate's health and physique should be sternly discouraged. The best examinations now conducted for junior scholarships are confined, so far as written tests are concerned, to papers in English and arithmetic. The written examination should, where numbers are not too great, be supplemented by a simple oral test. The examiners should also have access to the pupil's school record. Stress should always be laid upon physical fitness. Each local scholarship system might thus become an incentive to the healthy upbringing of children by making a fair standard of physical development a condition of eligibility.

THE SCHOLARSHIP SYSTEM AT A RESIDENTIAL UNIVERSITY.¹

By H. A. MIERS, F.R.S.

Waynflete Professor of Mineralogy, Oxford.

In the very brief contribution that I have to make to this discussion, I propose to confine myself entirely to the scholarship system at a residential university like Oxford. Here two main objects are to be secured:

(1) The opportunity for the poorer lads of marked ability to get admission to the university.

(2) The encouragement of an intellectual class of student, and the maintenance of a body of scholars who can live together to their mutual benefit.

To these may be added:

(3) Means of endowing industrious lads who are

¹ From a communication to the Educational Science Section of the British Association at its meeting at Leicester, 1907.

unable to win the greater scholarship prizes in open competition, but need endowment if they are to live at an expensive university—the residential system being necessarily more expensive—and

(4) The encouragement of special studies by special scholarships.

With regard to (1) there is very little now to prevent any lad of really marked ability from winning his way to the university by means of scholarships, however humble his origin. So far the present system is a success; provided that a boy can get his foot on the lower rounds of the ladder. But it is also quite certain that at Oxford scholarship money is spent on many young men who could afford to do without it, although the estimates of their number vary greatly. This is indicated by the fact that not a few scholarship candidates do afford to come to the university as commoners.

With regard to (2), it is most important that boys of ability should come together and form an intellectual class in the university, that they should consist of poor and rich alike, and that every college should have a considerable number of them, but that is no reason why they should all receive a uniform endowment of about £80 a year. It has been suggested that all scholarships should be of a nominal value, say, of £40 a year, and should only be supplemented by an additional endowment raising them to £80 or more for those to whom it is really necessary. This would liberate funds which would render it possible to bring to the university and to maintain there many of a highly deserving class whom I have just mentioned, namely, the industrious boys who are not quite up to the open scholarship standard, but who have everything to gain from a university career, and are a great strength to the university and the colleges. Call them exhibitioners or what you will, the point is that they should not be elected merely on open competition, but to some extent on personal recommendation. I would not for one moment relax the principle of absolutely free and open competition for the scholarship boys. The few cases of breakdown are far more than counterbalanced by the good results that follow from healthy competition, but the competition should be between the boys, and not between schools or colleges.

The present scramble for scholars not only between the two older universities, but also between the various colleges at each, leads to no useful result. It sometimes ends in very indifferent competitors being left for those colleges which come late. Add to this the worry and inconvenience caused by sending boys up from school for several successive competitions, and it is clear that there is room for more combination and organisation on the part of the colleges. The group system by which several colleges combine and hold the examinations together is a great improvement on the old independent system, and has been more developed at Cambridge than at Oxford. A college objection to large groups is

that, owing to the number of candidates, there is no opportunity for the examiners to become personally acquainted with them; but if the examination were held only twice a year it might be made more prolonged and more thorough than it is now, and give ample opportunity for the examiners to study their candidates on behalf of their respective colleges. From a large group system it is only one step to a still larger combination by which scholarship examinations would be really conducted by the university, say twice a year, and the scholars drafted into the various colleges. That such an arrangement is not impracticable is shown by the working of the Rhodes scholarships. This would, of course, leave each college free to reject an offered scholar, and would not preclude the possibility of a certain number of college scholarships in addition to those administered by the university.

The endowments that I have mentioned under (3) for boys below the highest scholarship standard might well be exhibitions administered by the colleges themselves. I should add that if the scholarship examinations were administered by the university, I would be glad to see the scholarships at the ladies' colleges brought under the same system, and largely increased in number.

In my opinion one of the great grievances at the present time concerning the scholarship system is the fact that the examinations are constantly becoming harder, and are tending more and more to enforce specialisation at schools. Anything which will prevent this would be a gain, and it would be far easier for the university as a whole to keep the standard uniform and general than for the individual colleges which are in competition with each other. It is as easy to select scholarship boys of real promise from a crowd of competitors, by means of a fairly simple and wide examination as by the more special and advanced examination which now prevails, and there is perhaps no reason why the same papers, including classics, mathematics, science, English and modern languages, should not be set to all competitors alike, though it might be necessary to preserve a distinction between scholarship examinations for modern-side boys and those on the classical side. But such things as examinations in classics or mathematics or history or science alone ought to be unnecessary; so long as they exist there is little reason why scholarships should not be given also for each of the other subjects which form part of the ordinary school curriculum. I believe that if the university scholarship examination were more wide and general, many of the evils of the present competitive examination would disappear; those evils are mainly due to the special cramming demanded by the present examinations. It would also be more possible for every and any school to have a chance of winning scholarships.

But with regard to (4), if scholarships in special subjects should be discouraged for schoolboys, they should be encouraged for another class who

are at present almost entirely overlooked by our university system, namely, the class of advanced students. A few of them from favoured countries are now provided for by the Rhodes scholarships at Oxford, but it is remarkable that while we are establishing all sorts of advanced courses, diplomas, and research degrees, we have established no scholarships to enable the poorer student to enter upon these courses, although there are probably many who are better qualified by their previous training for them than for the ordinary degree course.

A kindred need, which is also very often overlooked, is that for some provision whereby a scholarship may be prolonged for post-graduate study. Nothing is more valuable, both for a university and for its better students, than the maintenance of a considerable body of young men employed in research or teaching work, or in advanced study, under the direction of the university teachers.

Too many men drift away into professions or occupations for which they are not best fitted, merely because they cannot afford to stay on at the university at the exact time when a year or two of advanced work would supply just the intellectual stimulus that they require, and would enable those who possess some originality to show their capabilities.

Another matter of supreme importance is the influence of the scholarship system upon school teaching. The present harmful over-training of certain boys in special directions, and the consequent neglect of others, can only be prevented by examining on the normal curriculum, and by refusing to allow the examinations to increase in difficulty as they do now; in other words, to ensure that the scholarship examinations shall set the normal standard of curriculum for the abler boys at school, and not a standard which is only attainable by a few highly-trained boys of quite special ability; just as the ordinary entrance examinations to the universities, if they are to be maintained, should set the normal standard of curriculum for the ordinary boys.

To conclude, my suggestions amount to this: I believe that very considerable reforms are needed in university scholarships; that they should be by competitive examination of a less special character, should be in general of less value, and should be administered by the university; that exhibitions given otherwise than by examination should be administered by the colleges; that a certain number of scholarships should be awarded for advanced or post-graduate work; and that there should be more provision for prolonging ordinary scholarships for these purposes.

Stories and Anecdotes for Translation into French. By C. Heath. viii+72 pp. (Bell.) 1s.—To those who thoroughly believe in the educational value of elementary prose composition in French this nice little book may be recommended. It contains a number of anecdotes and short stories, with translations of difficult expressions and some grammatical hints, as well as a vocabulary, which seems to be complete.

THE SCHOLARSHIP SYSTEM AT THE PUBLIC SCHOOLS.¹

By the Rev. A. A. DAVID, M.A.

Headmaster of Clifton College.

MY remarks are intended to apply mainly to entrance scholarships at the public schools and the universities.

The present system is based upon two principles which should be clearly distinguished at the outset. The first may be identified with the original motive of scholarship donors and founders, namely, the desire to assist those who can prove their fitness for higher education, but would be unable to avail themselves of it without monetary aid.

It is not a little remarkable that, in a country not lavish in the respect it pays to intellectual distinction as such, the position of the "poor scholar" should have developed into one of honour. It is, of course, difficult to disentangle motives, but I should say with some assurance that upon the whole the status of a scholar at school or university is sought as much for the sake of the distinction it confers and the stimulus it supplies to self-respect as for its money value.

We may, therefore, lay down the second principle upon which the system is based as the recognition and encouragement of superior ability and attainment by means of a special status carrying with it a fixed emolument. The difficulty of the existing situation arises from the fact that these two principles cross each other and are applied in confusion. Open competition has naturally resulted in the bestowal of fixed emoluments on those who distinguish themselves in an examination, but may or may not be in need of financial assistance.

I do not know whether any attempt has yet been completed to estimate the extent of what may fairly be described as the malappropriation of charitable funds. Two colleges, one at Oxford and one at Cambridge, have begun an inquiry into the whole question, which, I believe, includes an attempt to gather statistics as to the number of those holding college scholarships, who without them would have been unable to come to the University at all. At present this proportion must be a matter of impression. But I think the opinion of those who have had most to do with schools and universities would be that the system has gone quite wrong enough to call for reform.

In devising such reform, two things should be borne in mind.

In the first place, it is most important that no separation should be made between students who need the monetary assistance of a scholarship and those who deem the distinction worth winning for its own sake, but except in a very few cases cannot bring themselves to resign the emolument.

It would be disastrous to form a class of necessitous students who would be compelled to bear

¹ A paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

a mark of poverty which would in any way debar them from full social intercourse on equal terms with their fellows. This consideration is of particular importance at the universities, where an undergraduate's education depends so vitally upon his chances of taking a full and unrestricted share in college life. There is plenty of scope for the exercise of economy by those who choose to be careful in the regulation of their expenses. In many colleges such economy need in no way cramp their social life. But there is a point at which it becomes unwholesome, and in order that their choice of associates and friends shall not be unduly limited, it is necessary that they shall start on a level with those who have come possibly with a less serious purpose, but nevertheless have their share to give and take in the common life.

I would therefore deprecate any attempt to impose a universal limitation upon scholarship candidates by demanding a declaration of need *before* the examination. Such a step would not only produce an undesirable effect upon the subsequent status of the scholar, but it would also be extremely difficult to exact with any approach to accuracy.

Take the case of a parent who would be required to declare whether or not he could send his boy to a public school or to the university without the assistance of exactly that scholarship for which he wishes to enter him. It might be almost impossible for him to say "yes" or "no" to such a question, and it would be equally impossible for the school or college authorities, before they have established any kind of confidential relations with him, to ask for such information as would enable them to assist him to an answer.

In the second place, it is important that the status of scholar should not be entirely dissociated from the money grant, which, like the scholar's gown, is a sign and symbol of an honourable estate. A very small emolument would be sufficient to seal the value of the distinction attained, but it must be attached thereto without question, and quite irrespective of the candidate's need.

The scheme I would suggest is as follows: I would reduce the money value of all scholarships in the first instance to something almost nominal. £80 is the usual value of a scholarship at Oxford. It is also a common value of entrance scholarships at public schools. I would cut them all down to £20. The balance of scholarship revenue would then be converted into augmentation funds, from which grants would be made privately *in full proportion to need*.

The investigation involved in the case of successful candidates would, of course, be difficult and delicate. But it must be remembered that the authorities would be communicating with parents or guardians with whom a personal connection would already have been initiated. It is much easier to ask for confidential evidence about a boy who has already been elected than about one who is "trying his luck"; and it is easier for a parent to give definite answers to

those who, by the fact of the election, have shown definite interest in his son.

Take a concrete instance. A boy is elected to an entrance scholarship at school or college, and is therefore sure of £20 a year. His father may at once apply, and probably has already applied, for augmentation. He is informed of the yearly sum for which his son may expect to live reasonably at that particular school or college. He is asked to say how much he needs to make up that amount, and to give confidential particulars which should enable the authorities to satisfy themselves that the boy *could* not come for less. It might be only another £20—it might be £100. Whatever it was, the assignment would be altogether private.

No doubt mistakes would be made, but it should be observed that few colleges or schools are without experience in the conduct of such investigations. At most colleges there are exhibition funds, at most schools augmentation funds, which are already administered in precisely the method described above. I believe that the same method would be found practicable on a far larger scale.

I would make one further point. It has been suggested that all scholarships should be reduced to a nominal amount in the first instance, and then augmented upon the result of subsequent examinations much in the same way that minor are converted into major scholarships at Cambridge.

There is a strong objection to such a method. It is to my mind most undesirable that a boy or an undergraduate should be liable to this kind of financial anxiety while he is at work. Once accepted as a scholar he ought to be assured of a reasonable easiness in money matters during the whole period of his residence, provided, of course, that his conduct and industry are satisfactory. It is certainly bad to employ this stimulus except in the last resort.

In conclusion let me sum up the advantages of reform in this direction:

1. The attractive and stimulative influence of this distinction would remain undisturbed.

2. Competition would be entirely open as before.

3. A very large annual amount would be transferred from those who do not need it to those who do.

4. Needy scholars would be delivered from a strain which often seriously affects the permanent value of their training.

5. Parents would be confronted with the moral obligation not to accept money which they do not require.

Kurzer Leitfaden der deutschen Dichtung. By A. E. Cop. viii+126 pp. (Bell.) 2s. 6d.—This short history of German literature is entirely in German, and is on the whole an accurate and conscientious piece of work. If we have any fault to find, it is rather owing to the presence of unnecessary *Fremdwörter*, such as *Heroen*, *Konflikt*, *regieren*, *Medium*, and of misprints, such as *g:festigte* (p. 5), *Hochaltur* (p. 11), *klag* (p. 25), *verbachte* (p. 33), *Studentlied* (p. 52), and to occasional negligence of style.

THE SCHOLARSHIP SYSTEM AS AFFECTING PREPARATORY SCHOOLS.¹

By G. GIDLEY ROBINSON, M.A.

TO no class of schools is the scholarship system of greater interest and importance than to preparatory schools, both in its financial and in its educational aspects. It will be convenient to group what I have to say about it under these two headings.

I. FINANCIAL.—If a boy is to get a public-school entrance scholarship, it is practically necessary that he should have been trained for the examination at a preparatory school. Now and again a lad of mathematical promise from a country grammar school secures election, or a clever boy, trained at home by a father with learning and leisure and the teaching gift; but these cases are comparatively rare; they do not affect the general rule. It would, however, be a fallacy to infer that, because a boy is educated at a preparatory school, therefore his parents must be wealthy and able to dispense with the help of a public-school scholarship to complete his education. Parents of narrow means often make self-sacrificing efforts to send their sons to a preparatory school, not only because they regard it as an indispensable step to success in winning the scholarship which is to help them through the next stage, but also because they believe that a boarding-school is the best training-ground for character. Moreover, preparatory-school masters, who realise how much they can do to help professional men of moderate means by reduction of school fees, often let their sympathy take this practical shape. It is, of course, true that a man whose school is not full may be glad to accept boys at reduced fees to keep up his numbers; but more is done than that. Not infrequently, I believe, schoolmasters who have no anxiety as to numbers help deserving cases which come under their notice, by charging nominal fees. A considerable number of boys, therefore, who pass through preparatory schools, are in more or less serious need of financial help, and for them public-school entrance scholarships are an inestimable boon.

On the other hand, it cannot be denied that many parents who could well afford to give their sons a public-school education without extraneous help are keen to get scholarships. There is something to be said for them. The prospect of winning a scholarship helps to keep a schoolboy up to the mark. How far it is good to appeal to the sporting instinct—the love of being first—which seems ingrained in the British boy, is open to question; but under the stimulus of competition he certainly works harder than he otherwise would. If successful, he starts well at his public school: he is put into a form well above the ruck, and the masters keep their eye upon him as a boy likely to do the school credit later. These are no slight advantages in a crowded world of perhaps five or six hundred boys, with thirty or thirty-five in a form. If elected on the founda-

tion at Eton or Winchester, he will live for five impressionable years among an unusually clever lot of boys, who will sharpen his wits and give him an interest in intellectual things. But, when all is said, we cannot get away from the fact that the scholarships in many cases go to the sons of prosperous people. Now and again, it is true, the money value of a scholarship is waived by a wealthy but conscientious father, or a mother will prefer one of the boarding-houses at Winchester or Eton, under a vague impression that boys are more comfortable there than in college. But, broadly speaking, I believe it to be true that scholarships are regarded by the public as "so many valuable prizes, carrying no obligation, which any boy may win who has brains enough."¹ That is the root of the matter. Scholarships have come to be regarded as *prizes*, not as endowments of an eleemosynary kind. So long as they are regarded as prizes, they will continue to fall to many who may want but certainly do not need them.

What is the remedy? The ideal would be that for the sons of rich people the scholarship should be honorary only, and, if a place in college is desired, that the money value at any rate should be refunded to the headmaster. But "rich" is a relative term, and the most practicable course seems to be that recommended by the Royal Commission on Secondary Education² in 1895, that "these scholarships should continue to be legally open to all classes, but should be restricted to a comparatively low value, the governing body of the school being entrusted with a discretion to augment their value in the case of any individual scholar, if they should consider that such augmentation is required by the pecuniary circumstances of the boy's parents." Something of this kind is already done at the R.N. College, Osborne, where a large reduction is made in the case of officers of the Navy and Army, provided they can show that the fees paid are a serious burden. Such a course, being a matter for private negotiation, would leave no stigma of poverty on the scholar. But no individual school, as the Bryce Commission recognised, could carry out such a reform by itself; hence the recommendation that it should be required by a general statutory enactment. If this were done, I believe the moral effect would be very great. It would bring home to the minds of many, who now never give the subject serious thought, that scholarships were never meant to be prizes.

II. EDUCATIONAL.—In offering entrance scholarships, the aim of the great public schools (and it is with a group of these that the preparatory schools are mainly concerned) is confessedly to attract boys who will do them credit later by winning honours at the universities and elsewhere; and on the ground that the universities do not recognise all-round equipment, "specialisation" may well be encouraged—to quote Dr. James, of Rugby—

¹ Dr. Rouse in *National Review* for October, 1906, s. v. "Open Scholarships."

² Report, vol. i., p. 303.

"even at the very earliest age."¹ The result is seen in the difficulty of the papers set in Latin and Greek, the excessive number of hours which preparatory schools are obliged to devote to classics, and the protest of a large majority of these schools "that no settlement of the curriculum will be satisfactory to their association, which imposes on young boys the rudiments of three languages besides their own."

There is, however, one important function discharged by the scholarship system which must not be overlooked. It supplies the readiest public test—I do not say the truest one—of the work and teaching of the preparatory schools; it sets a standard. In teaching, as has been well said, it is difficult to draw the line between skilled and unskilled labour; and anybody with sufficient capital, we must remember, might start a preparatory school to-morrow. It is inevitable, therefore, that the standard of work and effort should vary considerably between one school and another. Now scholarships, especially the more valuable ones, cannot be got without teaching ability on the part of the masters and steady hard work on the part of the candidates on their way up through the school. Moreover, such teaching is thorough, if on narrow lines, and the abler boys show results that are often brilliant in literary taste and expression.

On the other hand, the scholarship standard fixes the curriculum of the preparatory school from top to bottom, for the dull as well as for the clever; and the effects of the system on boys of moderate or less than moderate ability are wasteful and unsatisfactory. These boys are overburdened with languages—Latin and French at nine years of age, Greek or German at eleven—without gaining much education from them of a humane or literary kind. The plain fact is that the public schools have not sufficiently considered the curriculum question *from the point of view of the boy*. They want specialised material, and suggestions for reform are too often treated as attacks upon the classics and their rightful place in education. Whereas what preparatory schools really desire is a recognition of the fact that premature specialisation in any subject is bad; that children need opportunities of development on different lines; and that what is best in the preparatory-school stage must also be the best preparation for the public school. For the secret of good teaching is to give the pupil a sense of power, and therefore of life and growth and joy in his work. Some children will get this sense through the study of language, others through nature-study or handicraft. But every child ought to have the chance of showing in what direction his aptitudes lie, of discovering the gift that is in him. Even the future "scholar" is the better for the alertness of mind which comes of many-sided interest; no one ought to be considered cultured who is merely bookish, whose eyes are closed to the problems and appeals of nature, or whose fingers are all thumbs. And for the boy

who is stupid at his books to find that he can more than hold his own in the carpenter's shop or the drawing-school is to gain self-respect and a fresh incentive to effort, and healthy employment for leisure hours. Character and brains alike are the better for the discovery. And there is another thing to be considered. Scholarships, it is urged, are intended to be capacity-catching contrivances. True; but genius is in any case rare, and the best practical work in the world is often done by men of quite ordinary capacity, provided that they possess the qualities of patience and courage. It is not in these moral qualities that English boys are generally found lacking. Where they come short is in the things of the mind; too many of them are intellectually failures. And for this result the scholarship system is partly responsible, because its influence upon the curriculum has been unfortunate. We should trust the clever boy more than we do to look after himself; the immediate need is to remodel the curriculum in the interest of the rank and file, the boys of ordinary ability.

The first step—which could be taken without any violent changes of methods and standards—would be simply to postpone Greek (or German) and Latin verse-writing to the public-school stage. Five or six hours a week, at the very least, would then be available for other subjects. More stress could be laid upon the teaching of English literature and composition, as the main source from which, for the ordinary boy, literary and humane education should be provided, and subjects like nature-study and handicraft would have a better chance. Whether Latin would gain by being postponed to the age of eleven or twelve, I need not now inquire. But the question brings us to another difficulty—that of the teacher and his qualifications. The masters in preparatory schools are nearly all public-school men, the product of the traditional methods in education. Their teaching of classics has a long and organised experience behind it, and in the case of the abler boys produces remarkable proficiency. But if other subjects are effectively to take the place of classics as a means of training the boy-mind, the teaching ought to be of the same quality, and this cannot as yet be generally asserted of it. We have to remember that the teaching profession is becoming less and less attractive to men who have taken honours at the universities, and that, outside the classics, much teaching is still in the experimental stage. Already, with the reform of mathematics and the demand for oral methods in the teaching of French and German, complaints are heard of the "tangle" in which preparatory schools find themselves, of the difficulty of getting qualified assistant-masters. We are beginning to realise that in dealing with English literature and composition, the teaching of Latin and Greek is not the best model, and that better methods will have to be evolved. So, too, with nature-study: it is not enough to provide adequate time for it in the curriculum. The right kind of teacher will have to be found—the man who really has practical knowledge of

¹ Report of the Headmasters' Conference, 1897, p. 31.

the subject, and can deal with it in the simple language that boys can understand, not the mere lecturer, tied and bound to the text-book out of which he gives his lesson. Reformers, therefore, must "hasten slowly." The provision of the right kind of teacher will take time, and until he is available in sufficient numbers we must be prepared for comparatively poor results. But it would be a great step to have gained practical recognition of the principle that in the preparatory school intellectual interests of many kinds are essential, for the scholar as well as for the average boy.

CURRICULA OF SECONDARY SCHOOLS.¹

THE committee submit for consideration the following conclusions which they have reached as the result of their debates :

1. There is need for secondary schools of different types, with different curricula or combinations of curricula : because

(a) All boys are not suited to the same course of study.

(b) The requirements of the various callings upon which the boys will subsequently enter differ considerably.

(c) The needs of the schools differ in a considerable degree, according to the economic conditions of the districts in which they are situated.

Broadly speaking, however, the secondary schools fall into two different types—viz., those in which the majority of boys remain till eighteen or nineteen, and then continue their education at places of university rank; and those in which the majority leave at fifteen or sixteen and proceed to business. There is, however, no sharp line of demarcation between the two.

2. The committee consider that one modern foreign language should in all cases be begun at an early age; but are of opinion that it would be a wise educational experiment to postpone the systematic teaching of Latin as an ordinary school subject till twelve years of age, and that such a change will prove sufficiently successful to warrant its adoption.

On the other hand, they are of opinion that such absence of systematic teaching by no means precludes its incidental teaching before the age of twelve by such means as will naturally occur to a fully qualified teacher of young boys.

The committee also desire to record their opinion that the continued teaching of either of the two dead languages to boys who, after serious trial, have shown little or no progress in, or capacity for, such linguistic study has little or no educational value; and that, though the mental training afforded by such study is of great value in the case of many boys, yet in the case of others such study not only produces no good

results, but does positive harm to their mental and moral progress by reason of their incapacity to grapple with its difficulties.

The committee go further, and express their doubt whether the authorities in some secondary schools have sufficiently recognised this fact, or have provided sufficient alternatives to such linguistic study.

3. The committee deprecate any form of early specialisation in the education of children, and therefore regard with grave concern the fact that the entrance examinations at the great English public schools give undue prominence to the study of Latin (and Greek) in the course of education at the preparatory schools, the result being that too little time is available for (a) the teaching of the mother tongue, (b) manual training, (c) science and mathematics.

4. The committee would deprecate anything like State-imposed rigidity in the organisation and studies of secondary schools.

But the committee are led to the conclusion that up to twelve years of age there might be a broad general course of education for all. It would in all cases include careful preliminary training in the use of the mother tongue, so that it could be used in speaking and writing correctly on ordinary occasions, and would further comprise the following divisions :

(1) Literary ; (2) mathematical ; (3) scientific ; (4) manual training.

They consider that a school week of twenty-six hours might be divided as follows :

Literary work, thirteen hours; mathematical and scientific work, nine hours; drawing and manual training, four hours; while for those who after twelve years of age commence the study of Latin, the division of time should be : literary work, sixteen hours; other subjects, ten hours.

5. The committee are of opinion that the curriculum in secondary schools suffers gravely from the number of subjects which have been crowded into it, and they regard this as the most serious factor in secondary education at the present time. They are of opinion that this "overcrowding" is due to two causes :

(1) The disproportionate amount of time bestowed in many schools on the two ancient languages, which leaves only a small residuum for each of the other subjects now increasingly regarded as essential items of education, the result being that the pupil obtains only a smattering of the knowledge of such subjects.

(2) The ill-founded belief that the curriculum should be an abstract of all modern knowledge.

6. The committee desire to see a great simplification in the arrangement of examinations for secondary schools, and they strongly recommend that examination and teaching should go hand in hand, the examiners co-operating with the teachers and acting in conjunction with them in order to further the interests of real education.

The committee would urge upon the universities and professions to accept as qualifying for entrance the leaving certificates granted by each

¹ Report of the Committee of the British Association, consisting of Sir Oliver Lodge (chairman), Mr. C. M. Stuart (secretary), Mr. T. E. Page, Profs. M. E. Salter, H. E. Armstrong, and J. Perry, Sir Philip Magnus, Principal Griffiths, Dr. H. B. Gray, Prof. H. A. Miers, Mr. A. E. Shiple, Prof. J. Findlay, and Sir William Huggins, appointed to consider and to advise as to the curricula of secondary schools; in the first instance, the curricula of boys' schools.

university to the schools which submit to its inspection.

The aim should be to examine in accordance with the teaching, and to pay special attention to the special peculiarity of each school, or group of schools; and it would be a great relief, and at once improve the teaching of the higher forms, if the results of such examination were accepted by universities and professional bodies without further entrance test.

The committee particularly deprecate any uniform or centrally administered examination applied to all the schools of the country. For a uniform State examination, if it were made the door of entrance to all higher courses of study and to the professions and Civil Service, would do much evil, focussing the efforts of teachers and pupils upon those parts of the school curriculum in which alone examination is possible. Further, the rivalry between schools would cause the standard of attainment steadily to rise, until the over-pressure became serious, and intellectual vigour and independent thought were killed.

7. The committee feel that no scheme of secondary education can be satisfactory unless it is carried out by teachers of learning and force of character, and they would urge that every effort should be made, by conditions of appointment, by scale of salaries, and by retiring allowances, to attract a high class to the teaching profession, which should be regarded as a very laborious, but very honourable, form of public service. Prompt action in this matter is urgent and imperative; for, unless something is done without delay, the best interests of the schools, and especially of boys' day schools, will be sacrificed to a false and disastrous economy.

THE TEACHING OF BIOLOGY IN SCHOOLS.¹

By OSWALD H. LATTER, M.A.
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THE right of biology to rank as a subject in general education is now generally conceded and its merits recognised. As a training in experiment, in precision, and in exact reasoning it perhaps has not the advantages of physics and chemistry; but in quickening the powers of observation it is unsurpassed by any of the sciences. Moreover, it deals with phenomena which perforce must come before every man in the daily concerns of occupation and leisure, and on which indeed his very existence depends. The laboratory and all its paraphernalia are not always necessary for its pursuit.

Of the two biological subjects, zoology and botany, the former will receive my attention, rather at the request of those responsible for summoning this conference than because I attach superior importance to the subject in which I chance myself to have been trained. Twenty

years' experience as a teacher has convinced me that were I constrained to teach only one biological subject my choice would fall upon botany for purposes of general education.

At what age, then, (1) should the study of zoology begin? (2) Along what lines should it be pursued? And what relation should this subject bear to the other sciences which find a place in curricula? (3) How far may we proceed into zoological principles and philosophy? These questions apply to class teaching and not to those special divisions—elementary technical sets—which are for the most part composed of embryo medical students.

(1) Living animals present great attractions to and deeply interest the minds of quite young children. Thus there is the ample justification of Nature's own authority for a very early commencement. In the preparatory school and lower forms of public schools the standard indicated by the term "nature-study" is undoubtedly the very best form of science training. When applied to animal-study this resolves itself into observation of habits and life-histories, methods of locomotion, of feeding, and perhaps of breathing; noting of the external form and its special adaptations to the circumstances of life. It is essential that each pupil shall learn as the result of direct personal observation; mere reading and lectures, except that they may arouse some interest, are of no value. Assuming, then, that each pupil is provided with living specimens, the guidance of the teacher is needed to direct the attention to the important features. And here it is important to avoid doing too much. The guidance afforded should consist of a series of questions which can be answered only as the result of examination of the object. To tell the pupils that such and such is the case and then request them to verify the statement is destructive alike of interest and of the beneficial results which are the aim of all science teaching. But it is quite legitimate, after all that is possible has been found out, to impart a little additional information by way of explanation of facts observed. For example, supposing that the respiratory movements of a frog be under notice, we may ask the class to describe the movements of the throat, nostrils, ear-drum, and flanks, to note the condition of the mouth, to time the frequency of the various movements, and describe their relation one to another; but we shall not be wrong subsequently by the aid of a model and by blackboard diagrams to get the class to reason out, with a little assistance, how the air is forced into the lungs by the compression exerted by the floor of the mouth cavity.

(2) Both in the nature-study and in all later stages of class teaching the work should deal largely, indeed exclusively, with animals that are common. Insects, earthworms, mussels, snails, spiders, lobsters (crayfish), crabs, centipedes, fish, frogs and toads, newts, lizards and snakes, birds and the domestic and more familiar British mammals, form an ample stock of material from which to select examples. It is impossible to treat of

¹ Abstract of an address to a combined conference of the Zoology, Botany, and Educational Science Sections of the British Association at its meeting at Leicester, 1907.

all, nor is it desirable to attempt to make zoologists of everybody. Hence the "type-method," with its underlying idea of evolution, is not suitable for purposes of general education. What we aim at is rather that everyone shall gain an intelligent interest and sympathy with the lower animals, and shall understand to some extent how these live and move and have their being, their importance to man in his industries and otherwise, and, since man is an animal, something of the structure and healthy working of the human body.

With older and cleverer pupils pure nature-study methods become insufficient. As the mind matures it must have more solid matter to digest. In our enthusiasm for a new method of teaching we are all rather apt to supply an infantile diet to minds that are not thereby strengthened. The first mammal that was evolved in Nature's workshop probably did not continue to suckle her young after they acquired teeth fit for chewing solid food. We may, therefore, in our secondary stages, proceed to ask more about the "how" and the "why" of animal phenomena; in other words, to begin physiology. But this of necessity demands at least some training in physics and chemistry; and I am strongly in favour of interpolating a year devoted to the elements of these subjects before proceeding further with zoology proper. On the other hand, I would not separate function and structure into water-tight compartments, but as far as possible take them together.

A very large portion of the physiology should be human, even when we are dealing with invertebrate animals. A comparatively slight acquaintance with physical and chemical methods will enable pupils to find out many of the properties of bread, milk, eggs, butter, and other foodstuffs; saliva is readily accessible for experiments on digestive processes, and pepsin and hydrochloric acid can be purchased without much difficulty. Similarly the essential features in respiration can be ascertained with the simplest of apparatus; and when these are taken in conjunction with experiments on the combustion of foodstuffs part at any rate of the metabolic processes becomes intelligible. Pupils are always deeply interested in human physiology; indeed, I know no subject which holds the attention of classes more firmly; and incidentally it may be remarked that the opportunity arises of imparting many a valuable lesson in all aspects of hygiene. A very real difficulty is the question of laboratory work and dissection. In the short space of time usually allotted to science, dissection is almost impossible, even if there be laboratory accommodation for the purpose. Nevertheless a good deal of this can be done with some animals (*e.g.*, insects and crustaceans), if one rests content with externals and then supplements deficiencies by museum preparations, microscope slides thrown by the electric lantern on the screen, and so on.

(3) It would be valuable to obtain an expression of opinion from teachers present on the questions of introducing the theory of evolution and principles of classification, and, if these are to be

introduced, whether it is best to begin with the unicellular animal and work upwards, or to adopt the reverse course. My own feeling is that this part, the most interesting to the trained zoologist, is beyond the grasp of any but one's best class. The number of animals with which it is possible to deal is but few, and though it is clear enough that there is increasing complexity of structure and increasing differentiation of function among the organs, yet the premisses are not sufficient to warrant any conclusion that the higher has been evolved from the lower, nor to bring out the doctrines of homology. There are two natural opportunities of introducing the evolutionary aspect in these general courses. One occurs in studying the development of such animals as the frog and freshwater snail, where it is possible to see the unicellular ovum give rise to the multicellular adult, and the fish tadpole to the amphibian frog. The other can be combined with the principles of classification and homologies, as exemplified in the study of a series of closely allied animals, such as can easily be obtained among the crustaceans or insects, or, if more convenient, in the skeletons of vertebrate animals. The typical animals usually employed in university preliminary courses stand too far apart and require more supplemental lecturing than is advisable in a school course, which has not as its object a knowledge of the various styles of animal architecture.

Lastly, a word of defence against certain opponents is necessary. It is by some maintained that anatomy and physiology are "nasty," and even indecent, and not fit subjects of education *virginibus puerisque*. To come straight to the main point, it is the sexual processes of reproduction to which objection is made. It is even urged that zoology may be taught if this part of the subject be left out. There is no more mischievous suggestion. Are we to do all we can to encourage the study of animal life, and then deny all information and guidance on phenomena which are bound to come under observation, as though these were something unholy and unclean? Curiosity on these matters is natural and inevitable, and it is far better, it is best, that this legitimate curiosity should be satisfied and instructed in a clean, wholesome, and scientific way than by any other means. It is only so that a reverent respect for the whole body, whether of brute or man, can be gained. *Puris pura omnia.*

Rational Test Cards in Arithmetic. Head Teachers' Quartette Series. Third, Fourth, Fifth, Sixth, and Seventh Years. (Macmillan.) 1s. net per packet.—Each packet contains sixty-four cards, with two copies of answers, and the questions are arranged in a way that will be not only convenient for the teacher, but fair to the pupil. Each card has a test for each of three terms or for three scholars: the cards are arranged in "fours," and can be distributed to the pupils in more ways than one that satisfy reasonable examination conditions. Their use should considerably simplify the laborious but necessary work of examinations. The questions appear to be generally straightforward.

ON THE PRACTICAL DIFFICULTIES IN
OBTAINING MEASUREMENTS OF GROWTH
IN SCHOOLBOYS.¹

By E. MEYICK, B.A., F.R.S.
Marlborough College.

IT would seem to be a sufficiently simple task to obtain regular statistics of growth in schoolboys. The subjects are under control, and are available in considerable numbers at regular times and places; and they are, moreover, themselves usually interested in the process, and therefore not unwilling. At Marlborough College we have carried out measurements of the whole school (over 600 boys) on a uniform system annually for more than twenty years; but I am told that similar accumulations of results are rare, and the inference would seem to be that in practice the operation is not so simple of execution as it seems.

To begin with, supposing the authorities of a great school decide to take regular measurements of their boys, who is to do it? I need scarcely say that no salary, emolument, or honour will attach to the office; it may sometimes be added to the duties of the gymnastic instructor, but more usually some members of the teaching staff who are sufficiently interested must undertake it in their spare time. The latter is, in fact, the only practical course, as the gymnastic instructor will not be much interested in the results, and a single operator cannot deal efficiently with a large school, since the process would be much too long and tedious. As a rule, one operator is required for each class of measurement, and with this arrangement the average rate of measurement will in practice be one boy per minute. Of course, the tabulation and checking of the results by comparison with the previous year must also be subsequently dealt with, and provision must be made for their publication.

The next question will be to decide what measurements are to be taken; and when these are considered in detail and attempted in practice, all sorts of minor difficulties appear. It is exceedingly troublesome to get good measurements of anything which is capable of voluntary expansion and contraction, such as the girth of the chest. If the greatest expansion and greatest contraction are measured it will be found by experiment that a boy produces different results at every trial; whilst if it is attempted to take the normal or intermediate expansion, the result is still more untrustworthy. Probably also the chest measurement really fluctuates from time to time, and the comparison of annual results shows many inconsistencies. Measurements of the girth of arms and legs are open to the same objections, and in addition are troublesome from the comparative smallness of the differences to be apprehended, so that a numerically small error is relatively more serious. The head is not expandible, but the same difficulty is found of the small amount of growth to be measured, complicated in

this instance by possible uncertainty as to the amount of hair present. Tests of muscular strength or of lung capacity are found not to be trustworthy without considerable practice on the part of each boy, and it is impracticable to find time for this; some boys produce their best results in these very much more readily than others. Height and weight are easy to measure, and are not variable at will, but the latter at any rate may be temporarily affected by indisposition, and both are liable to inaccuracies such as will be indicated later. The contemplation of these uncertainties will probably make the operator dissatisfied with his work, and doubtful of the advantage of going on with it.

Errors still more considerable are, however, introduced in other ways. Measurements should be taken annually, but it is impossible to be precise in this matter; if any batch of measurements extends over a fortnight (which is about the usual time with us), the error from this cause may amount to 4 per cent. if the yearly increase is being considered. A boy cannot always come when wanted; he may be ill, or detained on other duties, or forgetful; and the dates and disposition of the school will vary from year to year. It is not possible to override other school arrangements and functions; and it would not be judicious to use too great stringency, and provoke unpopularity for the service among masters and boys by rendering it too onerous or causing it to clash with other engagements. All we can do is to make the yearly interval approach as nearly as possible to a real year; but it has to be called a year in any case.

Further, the measurements must be assigned to a certain age; in practice this cannot be stated more accurately than in years and months, and there is, therefore, in any given instance, a possible error of almost a month's growth. Actual error in the statement of the age is also common. The personal inaccuracy of the operator has to be taken into account; simple as each operation is when conducted leisurely and in a single instance, mental confusion is easily produced when a roomful of boys is being dealt with as rapidly as possible. In ascertaining the weight, for example, under our system, the operator has to notice that the boy has his boots (which he discards for height), and to calculate the weight from a combination of perhaps three different amounts, and as the combining weights are continually changing, it is easy to become confused as to whether one is using the 100 lb. or the 112 lb., 50 lb. or 56 lb. In checking the results I find that unsuspected errors of this kind are not uncommon. We weigh the boys in ordinary clothing; if they had to be specially dressed or undressed, much additional time and trouble would be required; but it introduces an additional element of uncertainty, since it is a very variable factor, according to weather and individual habit. The rate of growth in boys is often irregular or spasmodic, and hence the interval of a year between two measurements is too long for a

¹ A paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

proper comprehension of the process; but it would be hopeless to recommend such an increase of burden and difficulty as would be involved by more frequent measurements. Finally, the individual variation in different boys is very great; two boys of exactly the same age (*e.g.*, sixteen years) may differ by more than a foot in height, and more than 60 lb. in weight.

The impression which a scientifically minded operator derives from these elements of perturbation is that the whole process is so full of inaccuracy that it is hardly worth while going on with it at the expense of considerable personal inconvenience; and hence he may be tempted to abandon it. It is true that isolated instances of measurement so obtained are not of a high standard of value; but when the figures are considered in bulk, the objection disappears. In almost every case the error is as likely to be in one direction as in the other, and when a great number of instances is taken, the errors tend to balance each other, and a just average result is obtained. What is required, therefore, is not that those who are working should stop, but that a great number of additional workers should be obtained. I thought it might be useful and encouraging if I could give some figures to show that our measurements, imperfect as they are, do lead to some consistent and interesting results. I proposed to myself, therefore, to compare the heights and weights of boys at Marlborough College now with those of their predecessors twenty years ago. I took two groups of ages, *viz.*, those from fourteen years to fourteen years and six months, and those from fifteen years and ten months to sixteen years and three months, and found the averages for each month of age in the two periods 1885-7 and 1905-6 respectively, and smoothed the resulting curves. On comparison of the results obtained I found that the boys in the lower group of ages showed for the second period an increase of $1\frac{1}{2}$ in.— $1\frac{1}{2}$ in. in height, and $4\frac{1}{2}$ — $5\frac{1}{2}$ lb. in weight (the greater increase for the higher ages); and those in the higher group of ages showed for the second period an increase of about $\frac{3}{4}$ in. in height and 8 lb. in weight, as compared with the first period. I am satisfied that these figures are trustworthy, so far as to show that a very marked increase in size and weight has taken place during these twenty years. In connection with this I may mention that I am informed by Mr. V. Head, of Marlborough, who supplies hats to six schools, including Marlborough College, that unquestionably there has been a very marked increase in the size of heads of the boys of those schools (in all alike) during his forty years' experience; so that whilst formerly he was rarely, if ever, asked for a hat above $21\frac{1}{2}$ inches, he is now frequently called upon to supply hats of 22 and $22\frac{1}{2}$ inches, and even sometimes 23 inches. Without attempting to account for these facts, I think I may say that they support one another, and give good reason for thinking that labour spent in the collection of these statistics is not thrown away.

TYPES OF PHYSICAL DEVELOPMENT IN SCHOOLS.¹

By CECIL HAWKINS, M.A.
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WHAT the schoolmaster requires from a system of physical measurements is an easy means of discovering whether individuals or groups of individuals are thriving or the reverse.

A good rough estimate of the manner in which a boy is thriving can be formed by comparison of periodic measurements of his height and weight. In order that the lesson to be learnt from these observations may be sufficiently obvious a system of grades is required. Comparison with the rate of growth of the mean boy is unsatisfactory; a high-grade boy of fourteen will normally grow twice as fast as a low-grade boy, while at eighteen the low-grade boy should be growing twice as fast as the high-grade boy.

I have used for some years a set of tables by means of which the height and weight of all boys observed may be referred to one or other of twenty grades—all equally probable—of which grade 1 is the highest. The record of a boy's growth can conveniently be kept upon a form divided by parallel lines into twenty spaces to represent the twenty grades, separate graphs being drawn for height and weight. These graphs will be fairly level in rather more than 50 per cent. of the cases observed. In the majority of the remaining cases periods of steady rise or fall will be noted, in which the two graphs, as a rule, remain fairly parallel. In some cases the graphs are very irregular, constant fluctuations being apparent. In such cases the fluctuations in the two graphs are generally found to correspond.

Consecutive observations will give the same grade in about 50 per cent. of the cases observed. The graph normally rises in 25 per cent. and falls in 25 per cent., speaking roughly. Any disturbing cause will alter these proportions in a group affected by it; *e.g.*, in a school in which observations are recorded in March, June, and October or November I found that in the various intervals the percentages were:

In height	Up	Level	Down
March to June	25.4	53.0	21.6
June to October	33.1	45.7	21.2
November to March	14.2	47.3	38.6
In weight	Up	Level	Down
March to June	33.5	41.2	25.4
June to October	35.9	41.6	22.7
November to March	24.4	37.6	38.0

Variations in chest-girth are far more marked than those in height and weight, the chief disturbing factor being systematic physical training. Thus of 225 Haileybury boys—taken as they came—who were measured on entrance, and again after three terms of compulsory physical training, one boy improved 15 grades in chest-girth, three boys 13 grades, four boys 12 grades; 12 per cent. had gone down from 1 to 5 grades, 14 per cent.

¹ An abstract of a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

were level, 50 per cent. had improved from 1 to 5 grades, 15·5 per cent. from 5 to 10 grades, and 8·5 per cent. had improved more than 10 grades.

Typical schemes of development may be arrived at by working out the average grades of the type required. *E.g.*, typical athletes grade at 18, 7 in height, 5 in chest-girth, 3 in weight, and are early developed; typical gymnasts grade 13 in height, 7 in weight and chest-girth, the grade of height being very uniform throughout their scheme of growth; typical scholars grade 9 in height and chest-girth, 7 in weight. The importance of weight as a sign or factor of vigour is very marked.

For general use I would urge that a system of percentile grades be adopted, which should include all classes of the population. In order to construct such a system we require a large number of accurate observations, which must include children of all ages, subject to every variety of condition as regards nurture and environment.

THE INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.

WHATEVER may prove to be the net and ultimate result of its labours, the Second Congress on School Hygiene may be said to have justified the inspiration to which it and its predecessor at Nuremberg owed their birth. The ground covered by their discussions was, indeed, outlined centuries ago; and there are but few of the subjects reviewed which may not be found debated, and that often with a detail curiously modern and precise, in the writings of Milton and of Locke, of Rousseau, Goethe and Basedow, to make no mention of names more recent. Nor is this surprising. The problem of child-training has been recognised as a problem demanding effective solution since the dawn of civilisation. Time has not yet changed the human material with which it deals so as greatly to alter the intrinsic value of this factor in any educational scheme. “‘A sound mind in a sound body’ is,” writes John Locke, “a short but full description of a happy state in this world. He that has but these two has little more to wish for, and he that wants either of them will be but little the better for anything else.” And elsewhere in his “Thoughts Concerning Education,” he puts learning last, and thinks it the least part.

On the other hand, the conditions of life, the environment of the child, have changed materially and are still in process of evolution. As the result of some of the elements inherent in modern “civilisation,” new perils have arisen and others have acquired greater intensity; while, contemporaneously, each generation sees the addition of a larger number of the less capable in both mind and body added to the juvenile population for whom education is to be provided. So that, while the broad principles involved in training and maintaining “a sound mind in a sound body” remain practically immutable—since human nature is human nature still—there is ample room and

growing need for investigation, collaboration, comparison, discussion, and progress in regard to every detail of the methods applicable to that desirable end. In such circumstances, the value of international conferences of experts is obvious.

Further, the congress just ended seemed to be conscious of an influence urging it to an outlook somewhat beyond the terms of its immediate reference. More than once, following a note struck in the president’s opening address, there seemed more evidence than heretofore of the assumption, clearer and more generally recognised as obligatory, that the child of to-day is not the objective limit of its work. This generation of children as the parents of the next—the forefathers of generations yet to be; not merely the welfare of the boys and girls of to-day, but the success or the failure—perhaps the survival or the extinction—of a nation. Of recent years there would almost seem to have been a kind of dim awakening amongst the civilised peoples of the world to a realisation of the fact that civilisation does not necessarily ensure continued existence to the nations that profess it; that it not only may but does contain within itself the elements of self-destruction; and that, in more than one direction, there are not wanting signs that these are already in operation. From this point of view there is no extravagance in asserting that the gospel of health, which assumes its least selfish and its most effective form in its application to the home and to the child, is at once the purest and the most practical form of patriotism, as it is surely the most necessary.

Health is of no age or sex or period. The prophet of hygiene in the school, however—though he needs must refer to the home, since his labours in relation to the school are relatively futile if they be not preceded and seconded by similar efforts in relation to the family—has no direct dealing with the child prior to what is termed the “school age.” At what year is this territorial limit of home life to be drawn? The local education authority is permitted to consider the wishes of parents in this matter to some extent. But there is a practically unanimous consensus of opinion that the aggregation of children under six (or even seven) years of age in schools is economically wasteful, educationally disastrous, and involves a real danger to their own health, besides favouring the spread of infectious disease amongst the community. Below the age specified, the best training is most naturally and effectively acquired at home and in healthy play with other children; failing this, in crèches in charge of a bright, kindly, and sympathetic nurse, rather than in that of a teacher—“the best-informed teacher is not necessarily the best baby-minder.” In any case, pens, pencils, paper, pins and needles should not be handled in school by children under six at the earliest, at peril of damage to delicate and undeveloped eyesight. Most schools depend on “natural ventilation”—by doors and windows, &c. Under such conditions, size of room does not compensate for deficient exchange of air; and with

a given allowance of floor-space to each child, the small room has a definite advantage over the large room. It is a fact that the atmosphere of the average elementary-school room is far fouler than that of the worst slum dwelling room.

It is on the threshold of school life, too, that we are confronted with the subject of medical inspection. No one who has given five minutes' intelligent consideration to the subject would pretend that medical inspection is a be-all and end-all, complete in itself. Standing alone it has and can have no value to the child or to the race. As the first item essential to formulating and administering a system of social reformation, it is an absolute necessity. Briefly, its object will be to sample and classify the educational material of the nation; to separate those who are fitted to benefit by the ordinary educational curriculum from those who must be treated more or less exceptionally because they are themselves abnormal; to indicate, in each of these two main classes, those individuals who fall short of recognised standards, and the measures called for in the several cases; to ascertain from time to time the extent to which such measures have attained their object, and the directions in which they may need modification; and, incidentally, in collaboration with other agencies, to point out the sources of ill-health and infirmity in the child, and to suggest the means by which the incidence of these may be prevented in the future.

Although the Board of Education was not formally represented at the congress, it is quite understood that the result of the latter's deliberations has been awaited in order that the Government may the better formulate the terms of those provisions which it shortly intends to introduce on this subject. So that we may confidently expect that before long a grave reproach to our educational system, and one of the most serious obstacles to its efficiency, will be removed; and that, as Sir J. Crichton Browne observed, "this dilatory country" will at length follow the example of France, Germany, Belgium, Austria, Norway, Switzerland, Russia, Servia, the United States, Japan, Egypt, the Argentine Republic, and Chili in establishing the regular inspection of schools and school children, either as a State institution or under local organisation. Medical inspection must inevitably lead to the devising of measures for the prevention and correction of the racial perils which it glaringly reveals; for, to quote only the most sordid argument, it is clearly cheaper to feed a child sufficiently, to attend properly to its teeth, to provide it with proper spectacles, to safeguard its hearing, and to give it the special training (if called for) by which alone it can benefit, than to waste time and money vainly in failing to give it the education which its physical or mental disabilities render it incapable of assimilating. In this connection every teacher will have no small and no mean share. It will be his or her part to separate the obviously abnormal from the normal children at the time of their entrance into school life, and to distinguish,

from time to time, those who, in a lesser degree, fall short of the usual standard, in order that their defects—of eyesight or of hearing, for example—may be fully investigated; and to note with intelligence and sympathy such individual variations in health and ability as may demand some relaxation of educational pressure, or may suggest incipient disease.

To this end some training of the school teacher in elementary hygiene is requisite—not that parody of instruction such as is furnished by a departmental "set of printed rules," but—with in limits—a knowledge of the subject itself. How valuable this can prove, and how easily and pleasantly acquired, are sufficiently proved by the admirable work already accomplished by the training colleges in Scotland. Every real teacher is, whether he knows it or not, something of a biologist, and needs to be so. As Mr. Woods, of Columbia University, puts it, "The most important duty of the teacher in the realm of hygiene is . . . to see to it, from day to day, that the young person is in a normal healthy state. . . . It cannot be taken for granted that the child is in the best organic state possible. It is the duty of education to know whether the pupil is in his or her best possible condition or not; and if not, the reason for this should be determined." The teacher stands upon the watch-tower, and should be intelligently keen to give the signal when things go wrong, or better, when trouble of any kind is threatened. For the due exercise of this function, the teacher must be adequately prepared before being allowed to undertake the professional task of education. In the acquisition of this necessary knowledge, and still more in its daily application, he will find the source of a new pleasure, and in his daily work will meet with constantly occurring opportunities of instilling into the mind and life of the pupil the elements of those great health truths which the child will thus absorb almost unconsciously.

But the instruction of the pupil in the laws of health must not stop at this point. To those of older growth, a knowledge of elementary hygiene should be imparted as a definite item in the educational curriculum, and this in all classes of schools, in secondary and public schools no less than in the elementary and primary. It is quite a mistake to imagine that the study of elementary physiology and hygiene is not suitable for the young—that it tends to self-consciousness and morbidness. It is not enough to let the children have healthful surroundings, to develop in them an appetite for fresh air, personal cleanliness and active exercise, and to rely on the unwritten law of the school, the influence of the *genius loci*, to mould them to regular habits. All these things are good—they are more, they have an inestimable value. But "why not add instruction to the habituation; why not enlighten the practice by the theory?" A good habit is all the stronger if it be based upon or supported by knowledge. Even in the best schools there exist dangers arising from ignorance, dangers which are slow of

recognition, and not likely to be guarded against or removed by reliance upon rule-of-thumb methods.

There is a hygiene of the mind as well as a hygiene of the body; they are not distinct or disconnected; they cannot really be divorced. Under the guidance of the wise and well-trained teacher they can be made most usefully to reinforce each other. The occasional quiet talks between headmasters or headmistresses and some of their senior pupils on matters of importance do not carry less weight if both parties to the discussion are reasonably equipped with sufficient knowledge of what is essential to the possession of a sound body as the habitat of a sound mind. Ignorance is not always, or for all ages, the real safeguard of innocence. Knowledge is not necessarily synonymous with impurity: it is, indeed, the foundation of self-respect. To have learned to respect one's body is to have learned the basis of self-control. By such knowledge, wisely inspired and directed, can best be dissipated that "malefic miasm of ignorance" which dangerously clouds the delicate borderland between hygiene and morality, hygiene and character, hygiene and religion. By it can best be fostered that quality in which the results of modern education are most conspicuously lacking, the sense of reverence.

Here, again, is presented another aspect of the value of exercise—always in the open air, if at all possible. The influence of "folk-dancing" on young children has been proved in America, as well as in some European countries, in promoting the physical development as well as the discipline and the happiness of the pupils. For the teacher as well as for the pupil, appropriate physical exercises, intelligently supervised, are, in almost all cases, a necessary complement of the ordinary games of youth and childhood. But there is always need for the caution, lest physical and mental work should jointly overtax the bodily powers, and always the need for securing to each individual a full allowance of sleep. For boys especially, military drill has great advantages, and training in the use of the rifle gives to it an added zest, without at all tending to the development of an aggressive spirit on the part of the individual, but rather the reverse. It seems clear, if judgment is to be influenced by the observation of those whose actual experience of results best qualifies them to speak, that in the establishment of cadet corps and shooting clubs, and in the cultivation of a fondness for participation in concerted outdoor games, such as cricket, football, and hockey, lie the best prospect of checking the development of "hooliganism," which is, after all, only an expression of misdirected energy on the part of those who have acquired no taste for the active employment of their leisure in healthy pursuits; and also of correcting that abnormal folly which packs the youth of whole cities in idle thousands to watch and bet upon a score or so of professionals engaged in a game which the spectators do not care to play themselves.

The need for more health-knowledge, a better physical training, and a more sanitary environment for the teacher is borne in upon us by statistics which show that in America, at all events, the death rate of female school teachers from tuberculosis is practically as high as that of printers. The mortality for the male teachers is about one half of these figures—partly, no doubt, because they get more open-air exercise, and partly because the chest movements are not restrained by corsets. Deficient air-space, imperfect ventilation, the strain of their work, and too little sleep are potent contributory causes. Active tuberculosis amongst children actually at school is comparatively rare; and since children seldom expectorate, they seldom act as carriers of infection. In its latent forms, however (enlarged glands, diseased tonsils, &c.), the malady is much more common, and an early recognition of its evidence is important, in order that the child may be subject to effective curative treatment outside the school. Meanwhile, important measures towards eradicating this disease, which needlessly claims some 60,000 victims annually in this country, consist in the prevention of overcrowding in schools, in their efficient ventilation and better lighting, and in the practice of frequent and regular wet cleansing of the walls and floors of the schoolroom itself, the use of damp dusters to trap the chalk-dust in connection with blackboards, and improved sanitation of the pupils' homes.

Education has for long been too unsymmetrical, a one-sided conception. It has been mainly literary and humanistic. "Its tendency has been towards the study of books and words rather than of things; and its basis has been discipline, and not health." Not too soon are we awakening to the sinister significance of facts which warn us of perils demanding a readjustment of our methods, and which call for a due recognition of the rights which the body claims in the copartnership of man's humanity.

EDUCATION AT THE BRITISH ASSOCIATION.

By G. F. DANIELL, B.Sc.

IN his presidential address to the Educational Science Section, Sir Philip Magnus faced the question which many have asked: Is there an educational science? His conclusion was that we are not yet in a position to reply in the affirmative, but that such a science not only can, but ought, to be developed. The first steps are the acquisition of data and their systematisation, in order that scientific principles may be deduced therefrom. Dealing mainly with the reform of primary education the president referred incidentally to the report presented last year to the section on "Courses of Experimental, Observational, and Practical Studies most suitable for Elementary Schools." This able document is full of ideas which merit being tested by practical experience

of working on the lines laid down therein. It is worth while to take down the last volume of the British Association reports, and, having dusted it, to read this report once more. The process of dusting may suggest reflections on our method of employing (or wasting?) that part of the national brain-power available for scientific treatment of educational problems. A committee of busy and often eminent men and women is engaged for months in examining into the methods of training our future citizens. They confer and report, and the report is read, printed, and—shelved. Can we not organise some means by which inspectors, managers, and teachers are in all localities brought together to discuss such reports with a view to action in the class-room? It would appear that only the authors and immediate hearers would know what work is being done by the standing committees of the Educational Science Section. Yet its founder declared at Glasgow that the future of the section would depend upon the solid efficiency of these committees.

Leaving the readers of *THE SCHOOL WORLD* to study Sir Philip Magnus at first hand, I will deal briefly with the sectional work, which falls under six heads, viz. : anthropometrics in schools, scholarship systems, secondary-school curricula, the teaching of biology, domestic subjects, and technical training in relation to schools.

The discussion on anthropometrics took place at a joint meeting with the anthropologists, and the various speakers considered the matter from their several points of view, so that a really effective survey was possible. From the medical side Sir Victor Horsley and others dealt with the question in relation to medical inspection of school children; Mr. Ramsay Macdonald approached the subject from the administrative side; while the schoolmaster's practical experience was voiced by Mr. Meyrick and Mr. Cecil Hawkins. Mr. J. Gray and Prof. Sadler also spoke, and Baron Kikuchi explained the experience of the Japanese Government, which has statistics relating to the health of about a million children. Reports of committees (1) "On anthropometrics in schools," (2) "On conditions of health essential to the carrying on of the work of instruction in schools," were presented. It was clear from the discussion that although the public interest in this subject was mainly inspired by a "physical deterioration" scare, yet the advantages to be reaped from systematic continuous measurement of children were to help the teacher in dealing with the individual, the headmaster in dealing with the school, and the legislator in dealing with the community.

No better introduction to the scholarship discussion could have been wished for than the excellent paper by Prof. Sadler and Mr. Bompas Smith, who recognised the good effects, past and present, of our scholarship system, and did not confine themselves to denunciation, as did too many subsequent speakers. There was a fairly general agreement that the competition for university scholarships was exerting an unwholesome effect by its mercenary character. Principal Griff-

fiths gave a neat example by quoting the youth who could not accept a £40 scholarship, as "my master tells me I am a fifty-pounder." "And," added Principal Griffiths, "the boy was right; his master had correctly appraised his market value, and the boy would take no discount." Several speakers pointed out that education was vulgarised, and premature specialisation forced on schools, by the manner in which college entrance scholarships are awarded. One professor complained that he was unable to send his son to a preparatory school which did not prepare for scholarships, as no such school could be discovered! The provision of scholarships for girls was insufficiently discussed. Once more the giving of pseudo-scholarships as a bribe to entice pupils into the teaching profession was denounced, and once more no defender of the practice was to be heard. The desirability of awarding scholarships to lead to industrial or domestic training was a point made by several speakers, and emphasised by the president in his summing-up.

Perhaps the most interesting discussion followed the report of the committee "On Curricula of Secondary Schools," Prof. Armstrong directing attention to the fact that the Board of Education has practically assumed control of the bulk of secondary education through its grants and regulations. Sir Philip Magnus protested against the departure by the Minister of Education from the usual practice of submitting the policy of his department to the criticism of the House of Commons, and it was mentioned that the sectional committee had appointed a "watching" committee with power to act during the next twelve months. Mr. Page also spoke, and it was a pleasure to hear him supporting the report, which was presented with luminous annotation by Sir Oliver Lodge. The committee has been reappointed with additions, and asked to report next year "on the sequence of scientific studies." Prof. Morel (University of Paris) said that a new plan had been introduced in France since 1902. Secondary education extended over seven years, divided into two cycles, four years and three. In the first cycle five hours a week were given to modern languages, and in the second cycle they still held their place. For all boys between eleven and sixteen a living language was a chief subject of study. They aimed at transferring the educational functions of the dead languages to the living languages, but it was not yet possible to gauge the success of the attempt.

Among the papers on related subjects was a useful compilation by Mr. Thwaites, of Wyggeston School, Leicester, on "Conditions of Science Work in Secondary Schools." Visitors were also indebted to Mr. Thwaites for the interesting little exhibition of ingenious apparatus which he arranged in the school laboratories. Another exhibition which well rewarded those who visited the Narborough Road Schools was that of hand-work from the Leicester Council Schools, arranged by Mr. Charles Bird.

The Botany and Zoology sections united with educationists in discussing the teaching of biology in schools, and a large audience heard Mr. Latter and those who followed him. Pursuing the zoological branch, Mr. Latter advocated (a) nature-study at an early age, (b) the study of common animals, with attention to physiology. He would interpolate a year (at least) devoted to physics and chemistry, and deprecated any sharp division between the studies of function and structure. The paper contained many useful hints to teachers. Miss Lilian Clarke described the practical botany work at James Allen's Girls' School, Dulwich. Prof. Hartog spoke amusingly, and to the point; he did not hesitate to lay iconoclastic hands on certain idols of the professional pulpit. Prof. Hickson spoke on the training of natural history teachers, and the president urged that biology was especially suited to rural schools.

Under the heading "Types of Specialised Teaching" were grouped the questions of domestic and technical training in schools. Prof. Armstrong led with a strong paper, entitled "The Need of a Scientific Basis to Girls' Education from a Domestic Point of View." It is hoped that this will be published *in extenso*; it does not appear possible to give a summary that would do justice to its author. Incidentally it contained valuable suggestions for a course for the practical study of foodstuffs. Miss Stevens pleaded for a scheme of physiological hygiene, and Mr. Hugh Richardson gave one of those clearly-stated bright accounts of practical experiments in class teaching which the section has learnt to expect from him. Mr. Blair pointed out that one-third of the families in London had incomes below the "poverty-line" of 24s. per week, and considered the teaching of domestic economy with a view to a family budget of 28s. per week. From this point of view, the application of physics and chemistry was *in nubibus*. The antithetical grouping of utilitarians and their opponents was more marked in this discussion than in any other. The recent report of the Board of Education on the teaching of domestic subjects received severe castigation from more than one speaker.

Principal C. T. Millis, in his paper on "Problems of Trade Education considered in relation to our School System," urged the need for co-ordination between elementary schools, trade schools, and factories. The reforms needed were smaller classes, correlation of school subjects, and reform in teaching arithmetic; he asked for co-operation between parents, teachers, employers, and trade-unions. Mrs. Ramsay Macdonald read a business-like paper on "Day Trade Schools for Girls."

The discussions throughout the meeting were kept at a high level. No time was wasted by wandering from the main points, and the various aspects were fairly represented. The whole proceedings of the section are much better organised than in its earlier years, and whilst several of the earlier workers have contributed to this re-

sult, it is not invidious to express our indebtedness to the president and recorder (Sir Philip Magnus and Prof. R. A. Gregory) for their share in making the Leicester meeting of Section L a solid achievement of good spade-work in the cause of education. It is evidence of progress that whereas in 1901 the only association to send delegates was the Assistant-masters' Association, this year, in addition, representatives were appointed by the Headmasters', Headmistresses', Assistant-mistresses' Associations, the Teachers' Guild, the National Union of Teachers, the Associations of Directors and Secretaries for Education, Private Schools, Preparatory Schools, Technical Institutions, and Teachers in Technical Institutions.

SCHOOLS OF HELLAS.¹

MR. FREEMAN was a very young man at the date of his death, and readers of this book will be prepared to find some immaturity in it; nevertheless, it is a good book, and full of food for thought. It is specially interesting in that the author, himself a public-school boy, and evidently an admirer of the only kind of school which he knew, is quick at finding parallels, such as offer both encouragement and warning to the present day.

He first describes the Dorian system of education, where he sees the counterpart of our public boarding schools. In many respects the likeness is close, but in the essential feature of English schools, trust and responsibility, the Dorian ideal fails, the consequence being that the men who grew out of these boys were not fit to rule, and were only useful as units under a stern system of discipline. There, indeed, they have the advantage; discipline is the great lack in modern English society, as everyone knows, unhappily. The Attic system, on the other hand, is that of the voluntary day school. It is interesting to notice that along with this distinction goes the further distinction, that in the Dorian system intellect had no place, whereas in the Attic system it had the first place. This is a confirmation, although Mr. Freeman does not clearly see it, of the most damaging criticism now urged against English boarding schools. We do not believe that it is an unavoidable fault—on the contrary; only it needs careful treatment, and so long as the boarding schools are satisfied with their barren intellectual life, so long will the day school, or the school which is chiefly of day boys, be superior on the whole; provided, of course, means be taken to counteract the prevailing fault of day schools, lack of cohesion.

Mr. Freeman's study brings out other important points with force: the necessity for a harmonious development of all faculties and the principle of enjoyment. We hold strongly that all school

¹ "Schools of Hellas." An Essay on the Practice and Theory of Ancient Greek Education, 600-300 B.C. By K. J. Freeman. Edited by M. J. Rendall. With a Preface by Dr. A. W. Verrall. xx + 302 pp. (Macmillan) 4s. net.

work ought to be enjoyable. There is plenty of scope for self-discipline, intellectual and moral, in any course of education, without adding the burden of boredom or distaste. We believe that a course of study which causes distaste in ordinary boys is self-condemned, whatever the reason of the distaste may be; and this book will do good service if it drives home this lesson. Another lesson, of course, is the futility of trying to educate by means of technical instruction.

After describing the method of education in Greece, Mr. Freeman gives a few chapters to considering the theory, and he concludes with a paper summing up his subject. Here he draws some lessons for our instruction, which we hope may be taken to heart.

The work is based on independent study, and exact references are given throughout in footnotes. There is no other work of the kind in English, and only Girard's in French, which is twenty years old. The authorities, if not exhausted, have been searched, and a great deal of information well digested. We are not always disposed to agree with Mr. Freeman's speculations—where he says, for instance, that the debasement of Athenian character in the fourth century was due to their absorption in intellectual pursuits. But we acknowledge with gratitude the suggestiveness of the book, and its rich and well-arranged mass of information. The illustrations are excellent, and their being printed in black on brick-red paper makes them very like the vases from which they come.

ENGLISH COMPOSITION AND GRAMMAR.¹

THE first three of these books are of less importance than the remainder, and with them we begin. Mr. Rose supplies much useful information, with copious exercises. He writes for young pupils, including, we regret, infants. Why should infants be expected, for instance, to complete the ellipsis of "He is younger than I"? Let them even say "than me," and be happy. Mr. Wilsden suggestively explains how he imparts in a minimum of time the minimum of English grammar boys require for their Latin work. Sometimes (*e.g.*, on *ing*-forms) he might be fuller. He is the very antithesis of Mr. Rose. The latter believes in multiplying details for master and pupil: the former declares that for both details are useless.

Each page of "Notes" has three columns—"Heads"; "Examples and Truths"; "Method." The book seeks in briefest space to show how to teach every possible English subject. We fear its curtness tends to "cram," not to educa-

tion. Neither is it always correct. For instance, blank verse is merely called "a type of poetry which is not divided into stanzas," and "Milton, Pope, &c.," are the examples given!

Mr. Lovell's "Punctuation" is a masterly study—philosophical, historical, æsthetic, and practical. It inclines, however, to turn a good servant into a hard tyrant. Mannerisms like the following grow wearisome: "The reason, as Macaulay would have said, is obvious"; "Not that progress is always a good thing: the swine of Gadara in their madness made extraordinary progress."

The general superiority of American to English books on English composition is partly explained by the greater attention devoted to the subject in America. Mr. Huntington's "ideal programme" gives, the first year, grammar two hours weekly, composition three or four; the second year, grammar four (or five) hours, composition three (or two). With the longer time, the greater elaboration of American text-books is intelligible. We wonder if the elaboration encourages mechanical work and stifles individuality. The books under review are excellently planned, with details carefully worked out, while appropriate extracts from standard writers serve as models for the handling of themes. Mr. Huntington starts by emphasising the necessity of having something to say, and of saying it in one's own words, *to* someone, and in the best manner. He then lucidly discusses paragraphs, sentences, words, and the various types of composition. His subjects for practice are mostly selected from the everyday life—work and play—of American boys and girls. Further material is afforded by fifteen pictures—landscape, portrait, incident, architecture.

The "Manual" covers the same ground, but in a much more advanced way, laying stress, for example, on rhetoric. It handles effectively and with attractive illustrations the principles underlying narrative, description, exposition, argument, drama: in fact, it presents a study of literary theory and practice. Barring orthography, we unreservedly recommend the "Manual." We refrain from saying the same of Mr. Huntington's book only because it is so racy of America. Its American spellings, idioms and exercises, which render it "worthful" (his own word) there, diminish its school value here.

Racine, *Athalie*. Edited by G. H. Clarke. xxii+106 pp. (Blackie.) 10d.—We can speak highly of this edition. The introduction and the notes are excellent. We can only offer comments on some trifling points. On p. iv a reference to the rivalry of Pradon might have been made. On p. xii the pronunciation of the proper names might have been indicated in phonetic transcript, as this is employed elsewhere. On p. xiii the mode of scanning is unfortunate; it suggests that the alexandrine consists of feet, each of two syllables. What (we ask in humble ignorance) is the connection between *les cohortes de ses fiers étrangers* and the modern use of "mailed fist" (p. 85)? The expression "vowel h" (note on l. 269) strikes us as singularly unhappy.

¹ "Elementary English Grammar through Composition." By J. D. Rose. viii+117 pp. (Bell.) 1s.
"The Teaching of English Grammar and Elementary Latin." By L. W. Wilsden. 130 pp. (Blackie.) 1s. net.
"Notes of Lessons on English." 208 pp. (Pitman.) 3s. 6d.
"Punctuation as a Means of Expression." By A. E. Lovell. 91 pp. (Pitman.) 1s. 6d.
"Elementary English Composition." By T. F. Huntington. xxii+357 pp. (The Macmillan Company.) 2s. net.
"Manual of Composition and Rhetoric." By J. H. Gardiner, G. L. Kittredge, and S. L. Arnold. xi+500 pp. (Ginn.) 4s. 6d.

THE APPLICATION OF SCIENTIFIC METHOD TO EDUCATIONAL PROBLEMS.¹

By Sir PHILIP MAGNUS, B.Sc., B.A., M.P.

Is there an educational science, and if so, what is its scope and on what foundations does it rest? The object of the British Association is the advancement of science, and year by year new facts are recorded in different branches of inquiry, on which fresh conclusions can be based. The progress of past years, whether in chemistry, physics, or biology, can be stated. Can the same be said, and in the same sense, of education? It is true that the area of educational influence is being constantly extended. Schools of every type and grade are multiplied, but is there any corresponding advance in our knowledge of the principles that should govern and determine our educational efforts, or which can justify us in describing such knowledge as science? If we take science to mean, as commonly understood, organised knowledge, and if we are to test the claim of any body of facts and principles to be regarded as science by the ability to predict, which the knowledge of those facts and principles confers, can we say that there exists an organised and orderly arrangement of educational truths, or that we can logically, by any causative sequence, connect training and character either in the individual or in the nation? Can we indicate, with any approach to certainty, the effects on either the one or the other of any particular scheme of education which may be provided? It is very doubtful whether we can say that educational science is yet sufficiently advanced to satisfy these tests.

But although education may not yet fulfil all the conditions which justify its claim to be regarded as a science, we are able to affirm that the methods of science, applicable to investigations in other branches of knowledge, are equally applicable to the elucidation of educational problems. To have reached this position is to have made some progress. For we now see that if we are ever to succeed in arriving at fixed principles for guidance in determining the many difficult and intricate questions which arise in connection with the provision of a national system of education, or the solution of educational problems, we must proceed by the same methods of logical inquiry as we should adopt in investigating any other subject-matter.

In order to bring education within the range of subjects which should occupy a place in the work of this association, our first efforts should be directed towards obtaining a sufficient body of information from all available sources, past and present, to afford data for the comparisons on which our conclusions may be based. One of the five articles of what is known as the Japanese Imperial Oath states, "Knowledge shall be sought for throughout the whole world, so that the welfare of the Empire may be promoted"; and it may certainly be said that, as the welfare of our own Empire is largely dependent on educational progress, a wide knowledge of matters connected with education is indispensable, if we are to make advances with any feeling of certainty that we are moving on the right lines.

There can be no doubt that of late years we have acquired a mass of valuable information on all sorts of educational questions. We are greatly indebted for much of our knowledge of what is being done in foreign countries to the reports of different commissions, and more particularly to those special reports issued from the Board

of Education, first under the direction of my predecessor in this chair, Prof. Sadler, and latterly of his successor at the Board, Dr. Heath. But much of the information we have obtained is still awaiting the hand of the scientific worker to be properly co-ordinated and arranged. A careful collation of facts is indispensable if we are to deduce from them useful principles for our guidance, and unfortunately we in this country are too apt to rest content when we have provided the machinery for the acquisition of such facts without taking the necessary steps to compare, to co-ordinate, and to arrange them on some scientific principle for future use.

The consideration of education as a subject capable of scientific investigation is complicated by the fact that it necessarily involves a relation—the relation of the child or adult to his surroundings. It cannot be adequately considered apart from that relation. We may make a study of the conditions of the physical, intellectual, and ethical development of the child, but the knowledge so obtained is only useful to the educator when considered in connection with his environment and future needs, and the means to be adopted to enable him, as he grows in physical, intellectual, and moral strength, to obtain a mastery over the things external to him. Education must be so directed as to prove the proposition that "Knowledge is Power." It can only be scientifically treated when so considered. Education is imperfectly described when regarded as the means of drawing out and strengthening a child's faculties. It is more than this. Any practical definition takes into consideration the social and economic conditions in which the child is being trained, and the means of developing his faculties with a view to the attainment of certain ends.

It is in Germany that this fact has received the highest recognition and the widest application, and for this reason we have been accustomed to look to that country for guidance in the organisation of our schools. We have looked to Germany because we perceived that some relation had been there established between the teaching given to the people and their industrial and social needs; and further, that their success in commerce, in military and other pursuits, was largely due to the training provided in their schools. Unmindful of the fact that education is a relation, and that consequently the same system of education is not equally applicable to different conditions, there were many in this country who were only too ready to recommend the adoption of German methods in our own schools. Experience soon showed, however, that what may have been good for Germany did not apply to England, and that, in educational matters certainly, we do well to follow Emerson, who, when addressing his fellow citizens, declared: "We will walk on our own feet; we will work with our own hands, and we will speak our own minds." Still, the example of Germany and the detailed information which we have obtained as to her school organisation and methods of instruction have been serviceable to us.

Whilst all information on educational subjects is valuable, I am disposed to think that in our efforts to construct an educational science we may gain more by inquiring what has been effected in some of the newer countries. Wherever educational problems have been carefully considered and schemes have been introduced with the express intention and design of training citizens for the service of the State and of increasing knowledge with a view to such service, those schemes may be studied with advantage. Thus we may learn much from what is now being done in our colonies. Their efforts are more in the nature of experiments. Our colonies have been wise

¹ From the presidential address to the Educational Science Section of the British Association at its meeting at Leicester, 1907.

enough not to imitate too closely our own or any foreign system. They have started afresh, free from prejudice and traditions, and it is for this reason that I look forward with interest to the closer connection in educational matters of the colonies with the mother country, and I believe that we shall gain much knowledge and valuable experience from the discussions of the Federal Conference which has recently been held in London, and which, I understand, is to be repeated a few years hence.

But valuable as are the facts, properly collated and systematically arranged, which a knowledge of British and foreign methods may afford us in dealing scientifically with any educational problem, it is essential that we should be able to test and to supplement the conclusions based on such knowledge, whenever it is possible, by direct experiments, applicable to the matter under investigation. We have not yet recognised the extent to which experiments in education, as in other branches of knowledge, may help in enabling us to build up an educational science. Some years since there was established in Brussels an *Ecole modèle* in which educational experiments were tried. I visited the school in the year 1880, and I could easily point to many improvements in primary education which found their way from that school through the schools of Belgium and France to our own country, and, indeed, to other parts of the world. From a special report on schools in the north of Europe, recently published by the Board of Education, we learn that in Sweden the value of such experiments is fully recognised. We are told that in that country "it was early felt that the uniformity in State schools was of so strict a kind that some special provision should be made for carrying out educational experiments," and experiments in many directions have been made, mainly in private schools, which receive, however, special subventions from the State. We gather from the same report that the State regards the money as well earned "if the school occasionally originates new methods from which the schools can derive profit." I venture to think that experimental schools might with advantage be organised under the direction of some of our larger local authorities. The children would certainly not suffer by being made the subjects of such experiments. The intelligent teaching which they would receive—for it is only the most capable teachers who should be trusted with such experiments—would more than compensate for any diminution in the amount of knowledge which the children might acquire, and indeed such experimental schools might be conducted under conditions which would ensure sound instruction. Many improved methods of teaching are constantly advocated, but fail to be adopted because there is no opportunity of giving them a fair trial. As a general rule it is only by the effort of private individuals or associations that changes in system are effected, and teachers are enabled to escape from the old grooves on to new lines of educational thought and practice. It is not difficult to refer to many successful experiments. The general introduction into our schools of manual training was the direct result of experiments carefully arranged and conducted by a joint committee of the City Guilds and the late London School Board. Experiments in the methods of teaching physical science, chemistry, and geometry have been tried, with results that have led to changes which have revolutionised the teaching of those subjects. The age at which the study of Latin should be commenced with a view to the general education of the scholar has been the subject of frequent trial. I would like to see such experiments more systematically organised, and I am quite certain that the curriculum of our rural

and of our urban schools would soon undergo very considerable changes if the suggestions of competent authorities could receive a fair trial under conditions that would leave no manner of doubt as to the character of the results.

It would seem, therefore, that if our knowledge of the facts and principles of education is not yet sufficiently organised to enable us to determine *a priori* the effect on individual or national character of any suggested changes, education is a subject that may be studied and improved by the application to it of scientific method, by accurate observation of what is going on around us, and by experiments thoughtfully conducted. This is the justification of the inclusion of the subject among those that occupy the attention of a separate section of this association. Our aim here should be to apply to educational problems the well-known canons of scientific inquiry; and, seeing that the conditions under which alone any investigation can be conducted are in themselves both numerous and complicated, it is essential that we should endeavour to liberate, as far as possible, the discussion of the subject from all political considerations. Such investigations are necessarily difficult. We have to determine both statically and dynamically the physical, mental, and moral condition of the child in relation to his activities and surroundings, and we have further to discover how he is influenced by them, how he can affect them, and the character of the training which will best enable him to utilise his experiences, and to add something to the knowledge of to-day for future service.

Notwithstanding the undoubted progress which we have made, it cannot be denied that in this country there still exists a large amount of educational unrest, of dissatisfaction with the results of our efforts during the last thirty years. This is partly due to the fact that there is much loose thinking and uninformed expression of opinion on educational questions. No one knows so little as not to believe that his own opinion is worth as much as another's on matters relating to the education of the people. In this way statements, the value of which has not been tested, pass current as ascertained knowledge, and very often ill-considered legislation follows. In this country, too, the difficulty of breaking away from ancient modes of thought is a great drawback to educational progress. Suggestions for moderate changes, which have been most carefully considered, are deferred and decried if they depart, to any great extent, from established custom, and the objection to change very often rests on no historical foundation. Occasionally, too, the change proposed is itself only a reversion to a previous practice, which was rudely broken by thoughtless and unscientific reformers. The opposition which was so long raised to the establishment of local universities was largely due to want of knowledge on the subject; and certainly the creation, some seventy years ago, of a teaching university in London was actually hindered through a mere prejudice, which broader views as to the real purposes of university teaching and fuller information on the course of university development would have removed.

There never was a time perhaps when it was more necessary than now that education should be regarded dispassionately, apart from political bias, as a matter of vital interest to the people as a whole. Education nowadays is a question which affects not only the life of a few privileged, selected persons, but of the entire body of citizens. The progress that has been made during the last few years in nationalising our education has been very rapid. It may be that it has been too rapid, that sufficient

thought has not been given to the altered social and industrial conditions which have to be considered. We have witnessed a strong desire and a successful effort to multiply secondary and technical schools and to open more widely the portals of our universities. The object of the desire is good in itself. As the people grow in knowledge the demand for higher education will increase; but the serious question to be considered is whether the kind of education which was supplied in schools, founded centuries ago to meet requirements very different from our own, is equally well adapted to the conditions which have arisen in a state of society having other needs and new ideals.

Very rightly our students in training for the profession of teachers are expected to study the writings of Locke, Rousseau, Milton, Montaigne, and others; but many are apt to overlook the fact that these writers had in view a different kind of education from that in which modern teachers are engaged, and that their suggestions, excellent as many of them are, were mainly applicable to the instruction to be given by a tutor to his private pupil, and had little or no reference to the teaching of the children of the people in schools expressly organised for the education of the many. Only recently have we come to realise that a democratic system of education, a system intended to provide an intellectual and moral training for all citizens of the State, and so organised that, apart from any consideration of social position or pecuniary means, it affords facilities for the full development of capacity and skill wherever they may occur, must be essentially different in its aims and methods from that under which many of us now living have been trained. It has also been brought home to us that the marvellous changes in our environment, in the conditions under which we live and work, whether in the field, the factory, or the office, have necessitated corresponding changes in the education to be provided as a preparation for the several different pursuits in which the people generally are occupied. Yet, notwithstanding these great forces which have broken in upon and disturbed our former ideals, forces the strength and far-reaching effects of which we readily admit, we still hesitate to face the newly arisen circumstances and to adapt our educational work to its vastly extended area of operation and to the altered conditions and requirements of modern life.

When I say we hesitate to face the existing circumstances I do not wish to be misunderstood. As a fact, changes are continually being discussed, and are from time to time introduced into our schools. But such modifications of our existing methods are generally isolated and detached, and have little reference to the more comprehensive measures of reform which are now needed to bring our teaching into closer relation with the changed conditions of existence consequent on the alterations that have taken place in our social life and surroundings.

Four years ago, it will be remembered, a committee of this section was appointed to consider and to report upon the "Courses of Experimental, Observational, and Practical Studies most suitable for Elementary Schools." That committee, of which I had the honour to be chairman, presented a report to this section at the meeting of the association held last year at York. The general conclusion at which it arrived was that "the intellectual and moral training, and indeed to some extent the physical training, of boys and girls between the ages of seven and fourteen would be greatly improved if active and constructive work on the part of the children were largely substituted for ordinary class teaching, and if much of the present instruction were made to arise incidentally out

of, and to be centred around, such work." It is too early, perhaps, to expect that the suggestions made in that report should have borne fruit, but I refer to it because it illustrates the difference between the spasmodic reforms which from time to time are adopted, under pressure from bodies of well-meaning representatives of special interests, and the well-considered changes recommended by a committee of men and women of educational experience who have carefully tested the conclusions at which they have arrived.

The three R's, and much more than that, are essential and incidental parts of elementary education. But what is needed is a *Leitmotif*—a fundamental idea underlying all our efforts and dominating all our practice, and I venture to think that that idea is found in basing our primary education on practical pursuits, on the knowledge gained from actual things, whether in the field, the workshop, or the home.

Instead of fetching our ideas as to the training to be given in the people's schools from that provided in our old grammar schools, we should look to the occupations in which the great mass of the population of all countries are necessarily engaged, and endeavour to construct thereon a system with all such additions and improvements as may be needed to adapt it to the varied requirements of modern life. By this process—one of simple evolution adjusted to everyday needs—a national system of education might be built up fitted for the nation as a whole—a system founded on ideas very different from those which, through many centuries, have governed the teaching in our schools. In the practical pursuits connected with the field, the workshop, and the home, and in the elementary teaching of science and letters incidental thereto, we might lay the foundation of a rational system of primary education.

These three objects—the field, the workshop, and the home—should be the pivots on which the scheme of instruction should be fixed, the central thoughts determining the character of the teaching to be given in rural and urban schools for boys and girls. It was Herbart who insisted on the importance of creating a sort of centre around which school studies should be grouped with a view to giving unity and interest to the subjects of instruction. I have elsewhere shown how a complete system of primary education may be evolved from the practical lessons to be learned in connection with outdoor pursuits, with workshop exercises and with the domestic arts, and how, by means of such lessons, the child's interest may be excited and maintained in the ordinary subjects of school instruction, in English, arithmetic, elementary science, and drawing. In the proposals I am now advocating I am not suggesting any narrow or restricted curriculum. On the contrary, I believe that, by widening the child's outlook, by closely associating school work with familiar objects, you will accelerate his mental development and quicken his power of acquiring knowledge. I would strongly urge, however, that the child should receive less formal teaching, that opportunities for self-instruction, through outdoor pursuits, or manual exercises, or the free use of books, should be increased, so that as far as possible the teacher should keep in view the process by which in infancy and in early life the child's intelligence is so rapidly and marvellously stimulated. Already we have discovered that our scientific attitude towards primary education has caused us to overlook the essential difference between the requirements of country and of town life, and the training proper to boys and girls. Our mechanical methods of instruction, as laid down in codes, make for uniformity rather than diversity, and we are only now endeavouring, by piecemeal changes,

to bring our teaching somewhat more closely into relation with existing needs. But the inherent defect of our system is that we have started at the wrong end, and, instead of evolving our teaching from the things with which the child is already familiar, and in which he is likely to find his life's work, we have taken him away from those surroundings and placed him in strange and artificial conditions, in which his education seems to have no necessary connection with the realities of life.

The problem of primary education is to teach by practical methods the elements of letters and of science, the art of accurate expression, the ability to think and to control the will; and the ordinary school lessons should be such as lead to the clear apprehension of the processes that bring the child into intimate relation with the world in which he moves. During the last few years the importance of such teaching has dimly dawned upon our educational authorities, but, instead of being regarded as essential, it has been treated as a sort of *extra* to be added to a literary curriculum, already overcrowded. What is known as manual training is to some extent encouraged in our schools, but it forms no part of the child's continuous education. It is still hampered with conditions inconsistent with its proper place in the curriculum, and is unco-ordinated with other subjects of instruction. Moreover, no connecting link has yet been forged between the teaching of the Kindergarten and workshop practice in the school. We speak of lessons in manual training as something apart from the school instruction, as something outside the school course, on the teaching of which special grants are paid. Twenty or thirty years ago people used to talk about "teaching technical education," and from this unsatisfactory way of treating the close connection that should exist between hand-work and brain-work our authorities have not yet freed themselves.

It is true we have long since passed that stage when it was thought that the object of instruction in the use of tools was to make carpenters or joiners; but, judging from a report recently issued by the Board of Education, it would seem that it is still thought that the object of cookery lessons to children of twelve to fourteen years of age is the training of professional cooks. Until the Board's inspectors can be brought to realise that the aim and purpose of practical instruction in primary schools, whether in cookery or in other subjects, is to train the intelligence through familiar occupations, to show how scientific method may be usefully applied in ordinary pursuits, and how valuable manipulative skill may thus be incidentally acquired, it does not seem to me that they themselves have learned the most elementary principles of their own profession. An anonymous teacher, writing some weeks since in the *Morning Post*, said: "The cookery class can be made an invaluable mental and moral training ground for the pupils, the most stimulating part of primary education. It teaches unforgettable lessons of cleanliness and order, of quickness and deftness of movements. The use of the weights and scales demands accuracy and carefulness, and the raw materials punish slovenliness or want of attention with a thoroughness which the most severe of schoolmasters might hesitate to use. Practical lessons in chemistry should form an important feature of each class. . . . The action of heat and moisture on grains of rice provides an interesting lesson on the bursting of starch cells, and the children's imagination is awakened by watching the hard, isolated atoms floating in milk change to the creamy softness of a properly made rice pudding. The miraculous change in the oily white of egg when it is beaten into a mountain

of snowy whiteness gives them interest in the action of air and its use in cookery."

Can the teaching of grammar or the analysis of sentences provide lessons of equal value in quickening the intelligence of young children?

I must add one word before passing from this suggestive illustration of the value of scientific method in the treatment of educational questions. We live in a democratic age, and any proposed reform in the teaching of our primary schools must be tested by the requirement that the revised curriculum shall be such as will provide, not only the most suitable preparatory training for the occupations in which four-fifths of the children will be subsequently engaged, but will, at the same time, enable them or some of them to pass without any breach of continuity from the primary to the secondary school. There must be no class distinctions separating the public elementary from the State-aided secondary school. The reform I have suggested is unaffected by such criticism. The practical training I have advocated, whether founded on object lessons furnished by the field, the workshop, or the home, would prove the most suitable for developing the child's intelligence and aptitudes and for enabling him to derive the utmost advantage from attendance at any one of the different types of secondary schools best fitted for his ascertained abilities and knowledge. The bent of the child's intellect would be fully determined before the age when the earliest specialisation would be desirable. No scheme of instruction for primary schools can be regarded as satisfactory which is not so arranged that, whilst providing the most suitable teaching for children who perform must enter some wage-earning pursuit at the age of fourteen, or at the close of their elementary-school course, shall at the same time afford a sound and satisfactory basis on which secondary and higher education may be built. And I hold the opinion, in which I am sure all teachers will concur, that a scheme of primary education pervaded by the spirit of the Kindergarten which, by practical exercises, encourages observation and develops the reasoning faculties, and creates in the pupil an understanding of the use of books, would form a fitting foundation for either a literary or a scientific training in a secondary school.

THE SCHOLARSHIP SYSTEM AT OXFORD AND CAMBRIDGE.¹

By Dr. H. B. BAKER, F.R.S.

THE present system of open scholarships at the older universities owes its existence to Richard Jenkyns, Master of Balliol, 1819-1854. Until about eighty years ago help was given to students in two ways. There were scholarships, confined to particular schools, districts, or families, and there were servitorships or sizarships, the holders of which did not necessarily possess very high intellectual qualifications, but who were essentially poor men. Jenkyns's system was the offering of scholarships, after a competitive examination, to schoolboys without any reference to the question as to whether the money was or was not needed for their university education. The status of scholars was improved, and they were made to rank in the college immediately after the fellows. In a short time many of the most brilliant boys in public schools were attracted to the universities, and, what was more important, there was an improvement in the work of the

¹ Abstract of a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

schools, which benefited not only the prospective scholars, but also the rank and file of the school. The competition for open scholarships is perhaps keener in our own day than it has ever been, and the success of a school is now gauged, quite wrongly in my opinion, by the number of open scholarships it can claim at the end of the school year.

It has been several times suggested during the last few years that the scholarship system involves a great waste of money, and schemes have been proposed which, while retaining the stimulus of competition, give the money only where it is needed. This seems the only logical position, and were the question as simple as it sounds few would hesitate to adopt one or other of the solutions. The most recent of these proposals is briefly this, that all entrance scholarships should be of the value of £40 a year, and that they should only be increased when the parent could prove that the increase was necessary. On the face of it the proposal seems reasonable, with the one exception that the giving of £40 a year to a scholar who does not need it seems a half-hearted measure.

Exaggerated statements of the waste of money given in scholarships are so often made that an attempt to arrive at an approximation to the facts should be of interest. The heads of all colleges at Oxford and Cambridge were asked to give an estimate of the proportion of their scholars during the last ten years who could have afforded to reside at the University without the aid of their emoluments. Acknowledgment is gratefully made of the kindness of these gentlemen and of the tutors of colleges in compiling the statistics which it is now possible to bring before the section. The estimates show that at Cambridge 17 per cent. of scholars could have resided at the University without their scholarships, while at Oxford the proportion is only 6 per cent. But even in many of these few cases it was very largely the opinion of my correspondents that the money given in scholarships was not misused. The head of the college at Oxford which had apparently the largest percentage of wealthy scholars pointed out that they were largely sons of professional men whose incomes are uncertain. In these cases if the father happens to die during his son's university career there is no possibility of the boy's education being completed without external aid. Many have pointed out the difficulty in dealing with the figures supplied by parents with the object of proving poverty. Others consider that if scholarships were made purely eleemosynary the status of scholars would immediately fall, and a condition of things spring up which exists, to their great detriment, in some of the American universities. It must be remembered that the social life of the older universities is one of the most important things to a youth, and anything which would tend to diminish its educational value is much to be deprecated. Considering the disadvantages which the new scheme presents, I would advocate two alternatives.

First, let there be a voluntary relinquishment of the emoluments of a scholarship by a wealthy parent, the other privileges of the scholar being retained. It would soon become a point of honour for a wealthy man to refuse to accept money which would be so useful to poor men.

Secondly, let a former scholar who has attained in later life to a position of comparative opulence pay back his scholarships in some way or other for the help of other poor scholars.

With regard to the first of these proposals, I may point out that it is occasionally carried into effect. At one Oxford college six out of twelve wealthy scholars have

during the last ten years refused the emoluments of their scholarships, and isolated instances have occurred at other colleges. With regard to the second proposal, *cum veniret ad pinguorem fortunam* (when a man has attained to fatter fortune), as the St. Andrews statute has it, he should pay back the money which was the foundation of his fortune. This also is done, and perhaps more often than is known. Occasionally the whole sum is paid back to a college, but more frequently the former scholar, out of the not very fat fortune of a schoolmaster or college tutor, pays the sum back in helping poor scholars at the university.

Either of these systems of relieving college funds would, if backed by the force of public opinion, relieve an amount of hardship and poverty which is scarcely realised by any who have not been either poor scholars themselves or been brought into intimate contact with them. The cost of living varies very greatly at different colleges. It is possible to live with economy at many colleges on £120 a year. Two of my own pupils at Christ Church have managed with self-denial to limit their expenses to £110 a year. Since an open scholarship is £80 a year, and school-leaving exhibitions may give a man another £20 a year, it is not difficult to see that the very poor man has still need of assistance. Most colleges have an exhibition fund from which grants are privately made to the poorest students, and anyone who is willing to pay back his scholarship by the help of which, it may be, he has attained a good position, could hardly do better than contribute the money to such a fund.

EDUCATION AND EVOLUTION.¹

By the Rev. A. E. CRAWLEY, M.A.
Headmaster of Derby School.

THOUGH the literature of education during the last fifty years has been voluminous, the problems of education have never been examined on a sufficiently large induction of facts, and the biological and evolutionary point of view has been entirely ignored.

The principles which underlie the education of to-day are entirely unsatisfactory: they are fortuitous, traditional, or opportunist. The curriculum is overcrowded with subjects; many of these are not educational, in the proper sense, for real life; the results are nil. Vulgarity, squalor, obscenity, hooliganism, seem to increase with the education of the lower classes, while general capacity and power of thought have not increased. The individuality has actually been destroyed. Study of the subject in its anthropological and psychological aspects, and a long practical experience of teaching, lead to the following conclusions:

1. The education of a savage child is at once practical and liberal, and offers valuable lessons for our purpose.
2. Education should make, not good workmen, clerks, or citizens, but men.
3. The biological significance of childhood is: the child represents the future of the race in two senses of the phrase. The superficial and immediate meaning is obvious, but the other—the deeper, which is not generally understood—is that in terms of evolution the child is higher in the scale of development than the adult, just as the infant ape is much nearer to man than the adult ape. The importance of physical culture and athletics is not sufficiently understood. The neuro-muscular system is at present either not

¹ Abstract of a paper communicated to the Educational Science Section of the British Association at its meeting at Leicester, 1907.

exercised, or exercised improperly, or overworked. We ignore the delicacy of children's nerves. Especially fatal is the fallacy of brain-exercise: the brain is not a muscle; to venture on a paradox, there should be no work at all in schools. Mental fatigue is daily forced upon children to their incalculable injury.

The two prime needs are: (1) the encouragement of the imagination, which in childhood is actually at its best; (2) the exclusion of useless subjects.

Useless subjects will not pass the following tests: (a) A child must learn the world of nature, and later of men, as we now know it. This means nature-study and science generally. It must learn the various aspects in which a thing is knowable—surface, area, form, numerical values. Only so much mathematics is necessary as is required to work with science and mechanics. (b) It must know itself. (c) It must learn to express its knowledge and co-ordinate it.

History in the ordinary sense is useless, but biological and evolutionary history is essential. No languages other than the vernacular should be learned. The old plea of "culture" involves many fallacies. Culture comes from luxury and refinement of surroundings: it cannot be taught, and its only importance is in the æsthetic side of life. Ideal teaching should be the answering of children's questions in terms of the knowledge already acquired by themselves. As to the plea of "formation of character," there are many fallacies enshrined here and in the ordinary conception of duty.

SCHOLARSHIPS FROM ELEMENTARY SCHOOLS.¹

By A. R. PICKLES, M.A.

President of the National Union of Teachers.

SCHOOL RELATIONSHIPS.—In view of the rapid increase of municipal secondary schools and of the modernising of many of the older foundations, and especially in view of the most recent pronouncements of the Board of Education in favour of a broadly democratic scheme of higher education, it is of importance to define the precise relationship between the primary- and the secondary-school systems, in order to be able to discuss a scholarship system with any real profit.

THE AIM OF THE PRIMARY SCHOOL.—The old conception of the primary school as a place for teaching poor children the three R's, along with a smattering of history and geography, has happily receded, giving place to the new conception, which regards these schools as places for the formation of right habits, for the cultivation of thought and intelligence, and for fashioning the tools of learning. To regard a child's education as completed at the close of the primary-school period is an absurdity. He may, by imitation, by the aid of a retentive memory, and by an oftentimes puzzling inquisitiveness, pick up many scraps of useful information; but the powers of reason, of independent thought, of balanced judgment, lie latent in the young child to a very large degree. It is in the vital years from about twelve to sixteen or seventeen that these powers attain working strength, and it may therefore be considered that all which goes before the age of about twelve is merely preparatory, and that the real educational development properly dates from this time.

THE TRANSFER TO SECONDARY SCHOOLS.—As the artisan classes are taking an increasing share in municipal and

national government, the supreme Imperial task of our time is the raising of popular intelligence, and it is as desirable as it will be beneficial to give the artisan as broad an education as is given to those whose privilege it has hitherto mostly been. As yet the greater number of our working-class children must go out at the age of thirteen or fourteen to earn a livelihood, but it is to be hoped that in the very near future a much greater proportion of the children even of poor parents will be able to proceed to a secondary school, especially if they desire and deserve it. So the essential thing at the present moment is to popularise secondary-school teaching; to make the lower middle and artisan classes feel that they have as great an interest as anybody in our secondary schools. The narrow ladder must give place to a wide corridor between the primary and the secondary schools.

THE PRESENT SYSTEM INADEQUATE.—If this view of the aim of the primary school and of the relationship between the primary and the secondary school be granted, then it follows that our generally existing method of awarding scholarships is wrong in principle as well as inadequate. A local authority offers x scholarships, and primary-school teachers far too often look upon the winning of scholarships more as bringing kudos to the school than advantaging the child. They eagerly scan previous years' questions, and do their best to anticipate what questions may next be set; and, on the other hand, the examiner generally tries to set what he thinks the child will not know. Neither is to be blamed. Under present conditions they could hardly do otherwise. The system is at fault. Then the list is announced, and the child with 55·9 per cent. of marks may secure a scholarship, and the next one with 55·8 per cent. is "just out of it." Surely the fact only needs stating to show its absurdity.

The principle, too, is wrong, remembering the new conception of the scope and aim of primary education. Secondary-school teachers frequently lament the "falling-off" of scholarship children, despite the fact that a fair number of such have done well. If there must be a competitive examination, it would be preferable to give the candidates some new work to prepare in the examination room, and judge their capacity and intelligence by their power to get knowledge for themselves, rather than by their power to yield up what has often been so laboriously crammed into their heads.

NOMINATION AND CONSULTATION.—It would be well if all special preparation could be avoided. It should be possible at the end of the educational year to ask the teachers in primary schools what children desire and deserve to go forward to a secondary school, and, after nomination, the secondary-school teacher should meet the candidates face to face; then, by a few skilful questions and by consultation between the primary-school and secondary-school teachers, a wise selection could be made, a selection based, not upon the throw of a single examination—often too much of a lottery—but upon the child's school record and upon the secondary-school teacher's personal opinion of those latent powers which are at this time just beginning to make their presence evident.

NUMBER OF SCHOLARSHIPS.—There seems no reason why these scholarships should not vary according to the number of suitable applications. The list of children who may "desire and deserve" scholarships is not constant, but varies from year to year. There should be no poverty barrier. Maintenance allowances should be awarded where necessary, but no child ought to be transferred to a secondary school unless the parents are prepared to allow attendance for a full four years' course. For those who

¹ Abstract of a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

cannot do this the tops of the elementary schools should be strengthened in order to give an extended education for a year or two, of a type useful both for a livelihood and for life. That hybrid institution, the so-called higher elementary school, is a needless excrescence.

THE FUTURE OF BRIGHT CHILDREN FROM POOR HOMES.—As public money is spent to benefit the State as well as to help on the child, it would appear desirable that much more care should be taken to secure suitable employment for these children at the termination of the secondary-school course than is generally taken at present. It seems in one sense a waste of public money to give an efficient higher education to a promising lad, and then find him at fifteen or sixteen years of age starting work as an errand-boy, and even in some cases entering the ranks of unskilled labour. Not but that the errand-boy is all the better citizen for his education; yet it is disheartening to many a bright lad to find the doors bolted against him in the walk of life he would select, because he lacks influence. He should find it possible to serve his town and his country in that station in life for which his capacity and intelligence fit him, remembering Plato's rule, "that children should be placed not according to their father's conditions, but according to the faculties of their mind."

CO-ORDINATION OF CURRICULA.—It is obvious that the more natural and easy the transition is made from the primary to the secondary school, the less will be the wastage of time and effort in settling down in the new school. To this end there should be periodical conferences on questions of curricula, and, so far as is practicable, a continuity in the scope and aim of the instruction, with the object of rendering easy the passage of intelligent pupils from the primary to the secondary school.

TRADE EDUCATION IN RELATION TO OUR SCHOOL SYSTEM.¹

By C. T. MILLIS, M.I.Mech.E.

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THE object of this paper was to point out the several problems connected with the continuance of education beyond the elementary-school stage in the direction of technical or trade education, and to make suggestions that may be useful in deciding whether the higher elementary school or some other type of school is the best suited for the purpose. There is a general consensus of opinion that some reforms are needed in our elementary-school education to make it an effective preparation for the battle of life, especially for those children who will take up industrial work. The time is ripe for the discussion of the question, seeing that there is an increasing number of persons who feel that elementary education has hitherto given too much attention to the requirements of those going into clerical occupations and practically none to those of the children going into trades. The education has been too bookish, has tended to increase the taste for mere clerical work, and has not impressed children with ideas of the dignity of labour. The bright children wishing to enter the office or the Civil Service, or to become teachers, have had opportunities of entering secondary schools by means of scholarships, whilst, broadly speaking, there have been no schools of a practical character for children to enter who are going into trade, or scholarships provided which would assist them.

There is a great tendency to regard the effort to make good workmen as utilitarian and to a certain extent as derogatory compared with the humane side of education, though this side is often quite as utilitarian, in that it is given as a means of piling up marks and securing coveted positions in the professional world. The humane and utilitarian subjects of education are not mutually exclusive; each has power to make noble characters with high ideals for work, and education has no other object. The inference which seems to lie at the root of popular notions of culture, that the more useful a subject is the less is its culture value, is wrong.

New conditions in our industrial system owing to the introduction of machinery and subdivision of labour, combined with decline in apprenticeship, make it necessary to provide a broad basal training in our educational system for those who are to become skilled workmen, which will discourage young workmen from being content with a knowledge of one or at the most two branches of whatever trade it may be, and will render them more efficient all-round men, able to cope with the ever-varying conditions of manufacturing industries. The absence of such knowledge tends to increase the number of unemployed. The importance of the subject is recognised by the formation of apprenticeship committees, reports of education committees, Mr. Edric Bayley's pamphlet on "Industrial Training in Elementary Schools," and Circular 604 issued by the Board of Education. All these, as well as the establishment of several types of trade and technical schools, notably in London, are evidences of a feeling of unrest.

The types of schools may be considered under three heads: (a) Trade schools for girls; (b) technical (specialised) trade schools for boys for particular trades; and (c) technical or preparatory trade schools.

SCHOOLS OF TYPE (a).—Highly specialised training schools for girls, between fourteen and sixteen years of age, in needlework trades, as dressmaking, ladies' tailoring, waistcoatmaking, upholstery, &c., modelled on Parisian schools. These take the place of apprenticeship up to the "improver" or assistant stage, but would be more valuable if preliminary training were possible for one year between the elementary and the trade schools.

SCHOOLS OF TYPE (b).—For boys, between fourteen and sixteen years of age, hoping to become foremen and managers, chiefly from higher elementary and secondary schools. Engineering and bakery trades were chiefly dealt with. These only provide for the few bright boys and only touch the fringe of the question.

SCHOOLS OF TYPE (c).—For boys who will enter trades between fifteen and sixteen years of age, suitable for the mass, and providing preparatory trade training; specialisation to be deferred to the last year. Such schools are safest under modern conditions in that too early specialisation and late age of entering trades are avoided. No special ability is required. Fundamental principles relating to handicraft are taught; no attempt is made to replace workshop experience, but merely to shorten the period of learning a trade. Practical mathematics, science, drawing, and workshop practice in relation to various groups of trades are taught. The opinion of manufacturers is in favour of better trained workers, of whom they say there is a scarcity.

The State and educational authorities for many years have failed boldly to grapple with the question of providing better opportunities for the training of the industrial workers. There has been an indecision of policy; first we had a few day classes in the same subjects and under

¹ Abstract of a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

the same syllabuses as those suitable for evening classes in science and art; next the organised science schools under similar conditions, which were really not organised schools; these were improved, and we had what became known as the Division "A" type of schools, which were after transferred from the management of South Kensington to Whitehall on the reorganisation of the Education Department to a Board of Education. The Division "A" type of schools was squeezed out of existence by the regulations for secondary schools, and clause 42 of the regulations for evening schools was introduced as a means of dealing with schools of types other than secondary. Lastly, we had the higher elementary school minute, and by a process of evolution we are coming to the trade schools of various types.

The several types of trade schools are better suited to the needs of the times and are more needed than higher elementary schools. These trade schools, in close connection with or in technical institutes, and working under clause 42 of the South Kensington branch of the Board of Education, will be a greater success than any schools under the regulations of the Whitehall branch—that is, they should be administered under codes drawn up by those who are intimately in touch with development in technical work.

To get the full value out of such trade schools there must be reform in our scholarship system and in our elementary schools. The reforms most needed in our elementary schools are smaller classes, a simplified curriculum, fewer special subjects, more correlation, and improvements in the teaching of arithmetic, which must be taught in connection with geometry from an early age and be combined with manual work. Manual work must form a real part of the school work, and not be looked upon as a special subject.

Close co-ordination is needed between the work of the elementary school and that of the trade school, so that children will enter them better prepared between thirteen and fourteen years of age, and one year's work of the trade-school course will be saved.

The important general principles to be considered in the establishment and management of trade schools are:

(i) Plan the school course to permit boys to enter any given trade at the right age.

(ii) Co-ordinate the work at the beginning with that of the elementary school if possible, and *vice versa*.

(iii) Co-ordinate the last year's work with the system of apprenticeship followed in the trade to avoid waste of time.

(iv) Watch the labour market in order to guard against mistaken specialisation.

(v) Secure the right kind of teacher.

Properly managed by the co-operation of parents, teachers, employers, and trade-union leaders, there will be no opposition. An adequate supply of well-trained teachers in touch with the requirements of trade is necessary to teach the science subjects cognate to various trades, and for the special trade subjects the teacher must be a person who has had actual trade experience of workshop and factory conditions.

W. and A. K. Johnston's Illustrations of Insectivorous Plants. 3s. 6d.—This wall-sheet contains coloured pictures which may serve to convey rough ideas of seven of the best-known insectivorous plants. The descriptive paragraphs at the foot of the sheet contain no fewer than three errors in spelling, and the bladderwort is erroneously referred to as *Pinguicula vulgaris*.

CONDITIONS OF SCIENCE WORK IN SECONDARY SCHOOLS.¹

By R. E. THWAITES, M.A.
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In a paper on the "Internal Economy of School Science," read before the Public School Science Masters' Association in January, 1907, figures were presented relating to conditions of science work in thirty-six public schools. More recently similar data have been obtained from about the same number of secondary schools, working in conformity with Board of Education regulations.

In both cases information was asked for on the following points: Number of boys taking science in (i) general course, (ii) special course; average number in class; number of hours per week for (i) general course, (ii) special course; number of science masters; number of laboratory assistants; approximate annual expenditure for science; and answers to the following questions: Do you consider your present arrangements to be adequate in respect of (i) laboratory accommodation, (ii) laboratory equipment, (iii) staff, (iv) laboratory assistants?

The average results may here be given:

PUBLIC SCHOOLS.—In twenty-nine schools 60 per cent. of the boys take science: in twenty-three of these the average percentage of boys in the general course is 95, the remainder being specialists. The number in class for twenty-seven schools is 21·5 in the general and fourteen in the special course. The time for the general course is four hours a week, usually divided between chemistry and physics, and for the special course twelve hours. In eighteen schools the annual expenditure per boy was about £1. Chemistry costs more than physics for maintenance. In twenty-three schools there is a science master for every seventy-six boys and a laboratory assistant to every 147 boys. Sixty-five per cent. of the correspondents were satisfied with their laboratory accommodation, 71 per cent. with equipment, 77 per cent. with the number of the staff, and only 58 per cent. with laboratory assistants.

SECONDARY DAY SCHOOLS.—All boys above twelve years of age take science. The percentage of boys in the general course, lasting four years, is 94, in the special course 6. The average number in class in the general course is 22·6, in the special course eight or nine. The number of hours for science in the general course is rather more than four a week, and in the special course from eight to fifteen. The work is usually divided between chemistry and physics; very little biology is taught. The annual expenditure per boy for apparatus and chemicals is 8s. 6d., or 2s. for one hour of science a week. The average number of boy-hours a week for one science master is about 310. There is one laboratory assistant to 218 boys. Ninety per cent. of the correspondents are satisfied with their staff, 77 per cent. with laboratory accommodation, 80 per cent. with laboratory equipment, and 50 per cent. with laboratory assistants.

It will be seen that the ratio of specialists to boys in a general course is roughly the same in the two classes of schools. In the matter of expenditure, the day schools are markedly inferior to public schools. In both there are too few laboratory assistants. The consequences of this misguided economy are that the time of the science master is wasted in drudgery which could be performed less expensively by an assistant, and opportunity for preparation of experiments is lacking.

In answer to the question, "What do you consider to

¹ Abstract of a paper read before the Educational Science Section of the British Association at its meeting at Leicester, 1907.

be the maximum size of a laboratory division for successful work?" the average reply from thirty schools was: Twenty boys in the lower classes, twelve in the higher. It need not be said that these figures still represent only a pious aspiration in many cases.

Another question addressed to the same schools related to the advisability of teaching experimental mechanics as part of the science course. The answers showed a strong feeling of the value, and even necessity, of such a course as a preliminary to all advanced work in physics.

HISTORY AND CURRENT EVENTS.

"REFERRING to the possibility of war becoming more rare, Prince Bülow observed that there was a growing solidarity between the interests of nations, and that the least disturbance in one country affected all the others. On that ground it was reasonable to suppose that wars would gradually become less frequent." On the same page we read also a paragraph summarising the losses of Germany in South-West Africa; another stating that "agrarian disorders have broken out in the Russian province of Kherson"; a third reporting that "public opinion in Denmark is opposed to further concessions to Iceland"; and a fourth concerning a rivalry between German and English firms in supplying quick-firing guns to the Greek army. Yet Prince Bülow is an honourable man, and, we presume, an able and wise statesman.

Two members of the House of Commons have been referring to the impeachment of Oxford in 1715 and of Buckingham in 1627, connecting these events with the creation of peers recommended by those statesmen, and trying, by implication, to draw parallels between these events and those of the present day. The Prime Minister referred to the members as "archaeologists." He regarded impeachment, therefore, as an institution which had long become obsolete, and impeachments as events in that history which have no practical relation to current events. The whole proceeding was received by the House with amused laughter. We remember that a similar reception was given to a proposal in 1878 to impeach Lord Beaconsfield for bringing Indian troops to Malta during the crisis of the Berlin Conference. When was the first impeachment? When was the last? What is the nature of the process? How many have been successful? What light does the history of the institution throw on the Constitution, especially of the power of the House of Commons at any given period? Why is it now a subject merely of archaeology?

WE have now become familiar with what used to be called the "Celtic fringes" of the Anglo-Saxo-Danish population of this island. We have our chronic trouble with Ireland, and even Wales and the Highlands and Islands of Scotland do not quite agree with the Englishman. But our difficulties are apparently small compared with those of Germany and Austria-Hungary. Germany has Frenchmen in Elsass-Lothringen, Danes in Schleswig-Holstein, and Poles in her eastern provinces. To the French and Poles she is severe because there is danger on these two frontiers. Danes are treated more gently because Denmark is not likely to cause trouble. But even German troubles are nothing compared with those of the Austro-Hungarian Empire. We referred last month to difficulties between Magyars and Croats; and now we read that a Ruthene deputy in the Reichsrath wanted to speak in Russian, and was silenced because that was not one of the eight languages legally allowed in the deliberations of

the Diet. Is even Home Rule a cure for these national dislikes?

"THE Supreme Tribunal of Justice . . . gave judgment in favour of the validity of the recent non-Parliamentary decrees. This decision, being the unanimous finding of the twelve senior judges, is a distinct triumph for the Government." The news is from Portugal, where the King and Parliament are at variance. But have not the phrases a curious half-resemblance to what might have been a newspaper report (if there had been such things in the seventeenth century) of the result of that famous case *Rex v. Hampden*, 1638? And we think of the pillory and its connection with the censorship of the Press when we read further that a Portuguese Republican journal has been fined a second time for libelling the King. For "Republican" read "Puritan," and for "King" read "Archbishop," and the names of Prynne, Bastwick, and Burton instinctively rise to our memories. We wonder if King Carlos has read his Gardiner, and what he thinks of "Thorough."

ITEMS OF INTEREST.

GENERAL.

THE British Association held its seventy-seventh annual meeting during the first week of August, visiting Leicester for the first time. Favoured with bright sunshine, the meeting proved an undoubted success, the social side no less than the scientific. The places of meeting were rather more scattered than usual, but this drawback was mitigated by the admirable tram service, which also afforded cheap excursions over this prosperous town of more than a quarter of a million inhabitants. The programme included the usual popular discourses, garden-parties, and soirées; and the local committee earned congratulations and thanks. One of the most valued features of these annual congresses is the foregathering of friends separated for the rest of the year. It was a happy idea which inspired the designers of the loggia, a rendezvous whither many were attracted after the hard work of the sections to tea and a chat mid surroundings of a charm not easily forgotten. A résumé of the meetings of the Educational Science Section, by Mr. G. F. Daniell, will be found in another part of this issue.

THE vacation school inaugurated in 1902 by Mrs. Humphry Ward at the Passmore Edwards Settlement, Tavistock Place, London, met with even more success than usual this year. At the opening of the school at the beginning of August, Mrs. Ward said that the popularity of the school is shown by the fact that, whereas in 1902 the daily attendance was under 400, it rose this year to more than 1,000. The keenness of the children to come was shown by their happiness and energy, and by the letters received from parents whose feeling was altogether in favour of the school. The classes for handwork were extended this summer, tailoring was added, and the cookery class for boys was one of the most popular and most successful. For the woodwork class the London County Council lent a complete manual training equipment. The school is undoubtedly an interesting educational experiment, and the question is how to multiply such holiday classes. We agree with Mrs. Humphry Ward that school buildings and playgrounds vacant at this time of the year should be utilised for the organised recreation of children. As giving some idea of the subjects to which children take kindly as holiday pursuits, it may be said that at Tavistock Place the variety offered made it possible to suit every

taste. The children could choose from woodwork, cobbling, tailoring, gymnastics, swimming, cookery and housewifery, recreative needlework, netting and string-work, basket work and cane weaving, cardboard work, drawing and modelling, brushwork, nature-study, reading, dancing, singing, musical drill, dramatics, gardening, and organised games. Arrangements were made to allow all the elder children—the boys especially—to spend almost all their time on the handwork chosen by them should they so wish. Physical exercise and games, however, were compulsory on all.

THE nineteenth annual meeting of the Society of Art Masters was held at the Victoria and Albert Museum, South Kensington, at the end of July. Mr. Joseph A. Pearce, of West Bromwich, was re-elected chairman of the society. The annual report shows that the numerical strength of the society has been well maintained. A scheme for holding art examinations in secondary schools has been inaugurated by the council, and notices of the intention of the society to hold such examinations have been issued to nearly 2,000 schools. Though as yet the response of headmasters and headmistresses has not been enthusiastic, the experience of the first year leads the council to believe the examination scheme will prove useful to secondary schools.

UNDER the auspices of the Workers' Educational Association, and with the assistance of the Oxford University Extension Delegacy, a conference of working-class and educational organisations was held at the Examination Schools at Oxford on August 10th. More than 200 organisations from different parts of the country sent representatives. The Bishop of Birmingham presided, and during the course of his address referred to his recent speech in the House of Lords on the Universities of Oxford and Cambridge. He said that, quite in brief, what he wants is that the ancient universities, and Oxford in particular, shall be maintained before all else as places of serious study, so that it shall become more and more a self-evident truth that those who do not want to be serious students are out of place in a university, and that the endowments and resources of the university shall be made available as far as possible for all those who really want to be serious students. That means, in part, that they must be made available on the spot where the university is, and it means also, in part, that they must have university extension in the old sense, but also with a new application—that it shall be regarded as the normal function of the universities to supply thorough, systematic, and regular teaching. The Bishop of Birmingham advocated the formation of small classes provided by the Workers' Educational Association on the one side and the university on the other to supply the teachers.

THE autumn general meeting of the Incorporated Association of Assistant-masters will be held this year at King Edward's High School, New Street, Birmingham, on September 14th. The chairman, Mr. A. A. Somerville, Eton College, will deliver an address on the work of the year; a report will be submitted by the Emergency Committee on the Richmond (Yorkshire) case; and Prof. Muirhead, of the University of Birmingham, will read a paper on "Religion in Secondary Schools." A meeting of the council of the association will take place on the previous day. The South Midland branch of the association is making arrangements for providing hospitality for those members who desire it; early application should be made to the Rev. G. H. Moore, 3, Windsor Terrace, Hagley Road, Birmingham.

WITH the assistance of the Chadwick Trustees, arrangements have been completed to hold a new course on school hygiene, including lectures, demonstrations, and practical work, at University College, London, beginning on October 16th. The course will be given by Prof. Henry Kenwood and Dr. H. Meredith Richards. It is designed to meet the requirements of teachers, school lecturers, and those qualifying to become school inspectors and school medical officers. A certificate of proficiency will be granted to those who qualify themselves.

THE County Councils' Association has issued a return as to the assistance given by the various county councils to secondary schools in their respective areas. The return can be obtained, price threepence, from the secretary of the association at Caxton House, Westminster. The first question addressed to the authorities was: What grant for maintenance is given to secondary schools within the county, whether (a) block, (b) capitation, or (c) total maintenance? From replies to this question, it appears that block grants are the usual arrangement, while a fair number of counties possess county secondary schools which they maintain entirely. Capitation grants are given in fifteen county areas, and four of these authorities only do not restrict the grant to children within the county. In many cases county scholarships are tenable outside the county area. In fourteen counties the amount of the school fee conditions the amount of the county grant. Generally there is no differential treatment between endowed and non-endowed schools. These are the chief points dealt with in this very useful return, which we commend to the attention of students of educational administration.

IN our last issue (p. 308) we directed attention to the adoption by the authorities of Clayesmore School, Pangbourne, in their award of scholarships, of the method of selection of boys for entry at Osborne College. This month we have to record a very similar experiment on a larger scale in the West Riding of Yorkshire. The Education Committee of the County Council this year inaugurated a new form of examination for intending pupil teacherships and county minor scholarships. Under the new scheme there were three distinct stages in the examination: (1) a consideration of the original applications by a local committee of teachers with power to reject candidates whom they thought manifestly unfit; (2) two written papers, one on English, designed to test the power of accurate writing and to bring out native power of thought, the other a wide paper on arithmetic, so constructed as to give every candidate ample opportunity of showing accuracy of work, grasp of method, and ability to deal with simple problems rather than with mechanical rules; (3) an oral examination, confined in the first instance to those who had reached a given percentage of the possible total on the two written papers. Under certain conditions, however, a few other candidates who had taken the written papers were admitted to the oral examination on the special application of the head teachers.

THE oral examination consisted of a passage to be read aloud, followed by questions on any topic that suggested itself, designed to bring out in the main four points, viz.: powers of observation; powers of inference and grasp of an argument, involving the application of knowledge of facts and simple scientific principles to new conditions; general miscellaneous knowledge; power of rapid calculation—mental arithmetic. The chief difficulty to be over-

come was nervousness, especially on the part of the girls. The results were important and highly instructive. Especially in the case of intending pupil teachers the examiners were able to assess to some extent those personal qualities which go so far to the making or the marring of a teacher's career; and in the long run there is no doubt it will be to the rejected a boon to have been debarred thus early from starting on a career where they would never do well. One remarkable result of the oral examination was the reversal in more than one case of the judgment formed on the paper work only—at one centre it may almost be said that the candidates came out in exactly the reverse order to that in which they previously stood—and another was the great superiority in general of the candidates for the county minor scholarships over those who wished to become intending pupil teachers. One other point may be mentioned. In scarcely any case where candidates were rejected on the written examination, and subsequently at the request of the head-teachers admitted to the oral, did they prove to be worth the extra time spent on them—in some cases very much the reverse.

DR. THOMAS MUIR, Superintendent-General of Education for the Cape of Good Hope, in his report for the year ending September 30th, 1906, deals, among many other interesting topics, with the supply of trained teachers in the colony. Several causes, he states, combine to make it difficult to train locally an adequate supply of teachers even for the European schools. The first is the high number of teachers required in proportion to the number of pupils. Owing to the large number of very small schools this proportion is one teacher for every twenty pupils. The second cause is the short time the trained woman teacher remains in the profession, the average term of service being under five years. The number of trained teachers, therefore, required every year simply to fill up vacancies in the ranks is large beyond the average. Another cause lies in the vast extent of the country and the difficulties of travelling. Teachers trained in the more thickly populated centres decline invitations to posts in the more remote districts. The isolated life deters them, and the physical discomfort and expense of the long journey. From this it follows that the work of training must be carried on at many centres through the colony. Experience has proved that the only efficacious method of meeting the demand for trained teachers in the small rural schools of outlying districts is to train a sufficient supply in the central town school of the division. In the last place it may be added that for many years the northern South African States have drawn largely on Cape Colony for their supply of teachers.

THE latest report of the U.S. Commissioner of Education deals with the year ending June 30th, 1905. It is several hundred pages shorter than most of its predecessors, but is full of interesting information. In his introduction the Commissioner remarks that the percentage of male teachers in the whole teaching body in the States has steadily decreased for many years, but for the years 1900–1905 the total number of male teachers employed in the schools has actually declined, in spite of the great increase in the total number of teachers employed and the total number of pupils enrolled. In the case of city schools there has been no such decline in the numbers of masters at work, but, on the contrary, the percentage of increase in their number for the year 1904–5 was greater than the percentage of increase in the number of women teachers.

THE report includes an article by Mr. Andrew Draper on the New York secondary schools. The rapidity of growth in the high schools located within the territory embraced by the boundaries of Greater New York since 1897 is altogether unprecedented in the history of American education. In 1897 the number of high-school students was 2,360; in 1904, 27,824; an increase of 1,079 per cent. Within the same period the number of teachers increased from 111 to 841, or 658 per cent.; the annual expenditures from £32,200 to £584,530, an increase of about 1,700 per cent.

SCOTTISH.

A MEMORANDUM, prepared jointly by Dr. W. Leslie Mackenzie, of the Local Government Board, and Captain Foster, of the Scotch Education Department, on systems of physical training and their relation to the personal hygiene of school life, has been issued by the Department to members of the new provincial committees for the training of teachers. The circular may be said to ring the knell of the drill sergeant whose bluff frankness and choleric disposition have at once been the charm and the terror of school children during the past two or three decades. The circular very rightly points out that the military drill system which they stood for, although possessed of many valuable points, was altogether out of place in the training of children. The conception of growth has invaded the theories of physical training, and the new system is designed to suit children of different ages and different stages of development. Recent medical investigation has shown that a large percentage of children suffer from some physical defect or ailment which requires special treatment; hence the need for the "hygienic exercise," and hence also the necessity for the medical inspection of the pupils preliminary to any physical training in schools. The physical exercise of the future must be given under the direction and supervision of trained medical officers, assisted by instructors trained in the general physiology of nutrition and growth, in the physiology of bodily exercise, and in the recognition and management of defects and diseases.

DR. LESLIE MACKENZIE and Captain Foster have also issued a report on a collection of statistics as to the physical condition of children attending the public schools of Glasgow. The chief value of the figures is to be found in the fact that they are co-ordinated with particulars as to the housing and general physical surroundings of the pupils. For purposes of investigation, the schools were divided into four social groups. Group A comprised schools in the poorest district—twenty-six schools and 24,661 children; Group B comprised schools in poor, but not the poorest, districts—twenty-seven schools and 25,348 children; Group C comprised schools in comparatively good districts—eleven schools and 11,453 children; while Group D included schools in the best districts—nine schools and 11,395 children. It will thus be seen that the number of cases investigated was sufficiently numerous to justify general deductions being made. The facts brought out conclusively proved that the size of the dwelling-house has a remarkable bearing on the development of the child. The children reared in small houses were almost invariably smaller and lighter than those in more commodious dwellings, and the averages for height and weight rose very perceptibly in the progression from Group A to Group D. Perhaps, however, the most startling and surprising fact brought out is that in each group, from the highest to the lowest, these averages are below the standard averages.

of the Anthropometric Committee of the British Association. This, combined with the facts of physical degeneracy brought out at the School Hygiene Congress by the medical officer for Eton College, seems to prove that the degeneracy is not merely one of class, but one of race. One would, however, like to be certain that it is not the standard averages that are at fault.

TEACHERS who were actually serving in recognised positions in intermediate and secondary schools at the date of the issue of the regulations on the training of teachers (June, 1906) are required to make application to rank as specially qualified teachers in particular subjects before December 31st, 1907. Recognition will only be given for a genuine specialist qualification, such as very few teachers can possess in more than one or two subjects. Teachers who have hitherto taught all the subjects in their form will not be recognised as specially qualified in each of these, but only in that subject (or subjects) in regard to which they have held an important and responsible position in the school. Application for recognition should be made on special forms, which may be obtained on application to the Department.

An important circular has been issued by the Scotch Education Department providing for the future allocation of the grants for instruction in science and art. These have hitherto been paid at so much per head per hour. The Department has at this late hour awakened to the fact "that the placing of a premium on a single department of work in a secondary school is educationally unsatisfactory." For the future, therefore, it is proposed to make the whole work of the school the basis of grant, and not merely selected subjects. It will be a condition of grant under the new regulations that the work of the school be conducted according to a curriculum proposed by the managers and approved by the Department. In this curriculum due provision must be made for instruction in science and art, but having due regard to the other subjects that should form part of a well-ordered course of secondary education. It has been found possible to increase the grant thus available for distribution from £17,900 to £44,500. A very tempting bribe is thus held out to secondary schools to put themselves completely under the ægis of the Department. The reform in the method of allocating the grant is wholly admirable, and should be extended to elementary schools as well; but it is not for the good of education that one class of school after another in Scotland is compelled to surrender its independence and pass over, bound hand and foot, to the direction of a remote central authority, admirable as it has often shown itself to be. All advance springs from variation of type, and the fates seem to decree that in Scotland in future there shall be no variation.

THE passing of the training colleges, so far as denominational control is concerned, is now an accomplished fact. On August 1st they passed under the control of the provincial committees, although technically the transference cannot be legally completed until the passing of the provisional order. The Scottish training colleges, though nominally denominational, have really been national institutions, and have done national service. The services of the churches in this connection should not be forgotten. When political parties and Government itself had little concern for education, these bodies came forward and at great expense provided schools and training colleges. These they administered with a single eye to national interests, and in no case for proselytising purposes. At the desire of the Education Department they have now

handed over these training colleges with their splendid equipment, their capable staff, and their great traditions. They are taken over, as the senior chief inspector testifies, in a state of the most thorough efficiency, and it is hoped that under the new authorities they will not only maintain, but increase their reputation.

SIR HENRY CAMPBELL-BANNERMAN, in intimating the Bills he hoped to see passed this session, included among them the Education (Scotland) Bill. Scotland, he said, had waited long for the Education Act, but it would only be passed this session if treated as an unopposed measure. Mr. Gulland earnestly hoped that the Government would persevere with the measure. Education in Scotland was being paralysed because of legislative inaction. Sir Henry Craik, speaking on behalf of the Opposition, said that there would be no obstruction of the Bill from his side of the House, and he was ready to do all he could to help the measure forward. But he warned the Government that he would not take it in an emasculated form with the provisions for the better pensioning of teachers omitted, as had been suggested in certain quarters.

SCHOOL boards and managers of schools in Scotland are reminded that next year separate papers in history and geography will be set for those candidates who are presented in higher English. It has been decided to allow one hour and a half for each of these papers instead of one hour, as intimated previously. The specimen paper in geography which has been issued is on excellent lines, and follows closely the most approved methods of treating this subject. A specimen paper in history will be sent out at a later date.

IRISH.

THE Report of the Intermediate Education Board for 1906, recently issued, is on the usual lines, with one conspicuous exception. The Board has felt bound "once more to call the attention of his Excellency to the urgent necessity of establishing a permanent system of inspection," and this is done in a protest covering three and a half pages of excellent argument. The Government's action in recent years, it is justly said, has led to an "enforced stagnation of policy now severely condemned by cultivated opinion in Ireland: it is perpetuating a false and corrupting conception of the real ends of education; and it is sacrificing the highest interests of large numbers of pupils whose gifts would respond to a more elastic and skilful treatment." The report points out the large number of important departments of school life which cannot be touched by a mere examination system—the number and qualifications of assistant teachers, methods of teaching, the time-table and distribution of work, the system of promotion and discipline, the moral tone and manners of the pupils, the character of the school buildings, with reference to health and good order, the capacity and ventilation of the class-rooms, the provision of libraries and reading-rooms, and the arrangements for games and recreation. While the inspector would by conference suggest improved methods of teaching and organisation, the schools would regain their freedom. It is to be hoped that this memorandum will not fall on deaf ears.

THE Board is not equally emphatic on that other side of school efficiency, viz., the school grant, and note might well have been taken of the loud and deep discontent at the reduction year after year in the rate of payment. The scale for 1906 varies from £3 3s. per pupil passing in the preparatory grade to £21 5s. 3d. for a pass with honours in the senior grade. In 1905 the corresponding figures were

£3 16s. and £25 13s. Three years ago the rate was nearly double what it is for 1906. While the teacher may possess an *animus non temere avarus*, the discouragement he feels when his earnings year by year decrease is not likely to be allayed by the kindly words, however honied, of an inspector.

WE must do the Board, however, the credit to say that the total amount of the grant, £50,000, was not less than in 1905, but even to keep this figure the Board was compelled to transfer over £2,000 from capital to current account. The decrease in the scale is therefore only partially accounted for by the Board's falling income, and as a matter of fact is due to what in itself is a subject of national congratulation, the increase in the number of pupils entering for the examinations. This is the more remarkable in view of the decreasing population of the country. The number was the highest on record, viz., 10,967, being 1,290 or 13·3 per cent. more than in 1905. The boys totalled 7,790, and the girls 3,177. The numbers entering in the different grades were—boys: senior 482, middle 1,305, junior 3,700, preparatory 2,303; girls: senior 210, middle 516, junior 1,558, preparatory 893. The proportion per cent. that passed was 63.

THE number of schools was 306, the average grant being therefore £164. The highest grant to a single boys' school was £2,212, to the Christian School, North Richmond Street, Dublin; and to a single girls' school £730, to Victoria High School, Londonderry. The permanent administration cost £4,773, the examinations £15,390, and the rewards £9,645. There are interesting tables dealing with each subject in detail, giving the number examined, the number examined in honours, the proportion per cent. of those who passed, and passed with honours, and so on.

ANOTHER pamphlet issued this summer by the Intermediate Education Board is the "Reports of the Examiners for 1906," a belated document which could only be useful to teachers if published early in the educational year, say about Christmas time. Year after year these reports come out so late that teachers ignore them. There is no apparent excuse for this lateness, as the results of the examinations are published early in September. The pamphlet covers fifty-two pages, and the reports are of divers lengths. The Latin examiner confines his remarks to half a page, but some of the others (e.g., in Irish and mathematics) cover several pages. The reports, taken as a whole, point to several very general and serious defects in teaching. There is in nearly every report complaint of lack of neatness and order, weakness of punctuation, badness of spelling, and failure in observation even of things which are on the written papers of questions. That these faults are radical is shown by the science reports. The science teaching is experimental and practical, and yet we find the examiners in this subject complaining that the candidates use the laboratory only to verify statements taken from books. They do not observe properly nor trust to their own experiments. Starting with a preconceived idea of what should be the result of an experiment, they stifle the very faculties of observation which the subject is intended to develop. In other words, quite apart from what subjects are taken up, there is clearly a very grave deficiency in teaching methods.

ABOUT Easter it seemed fairly certain that the Chief Secretary would do something to improve the finances of the intermediate system by making good with a supplemental grant the falling off of the revenue of the last three years. It is now, however, apparent that this hope will be delusive. The Government has stated that no supplement-

tary vote is to be introduced, and Mr. Asquith has told a deputation of primary teachers, introduced by Mr. J. Redmond, that all that was proposed this year for Irish education was the £40,000 building grant for elementary schools, but that next year he hoped to be able to lay before Parliament proposals to remedy some educational grievances which he admitted deserved redress.

WELSH.

THE differential treatment of council and non-provided school teachers in Merionethshire has naturally caused a great deal of comment. The non-provided school teachers had their last term's salaries withheld, even on into the holidays, whilst the council school teachers' salaries were duly paid in good time before the schools closed. One teacher, it is said, in a non-provided school held at insurance policy; the month's grace expired, and the insurance could not be met. Of course, it may be said that teachers must be living up to their means if their savings are not a quarter, or even a half year, in advance of their salary. This is perhaps the worst point in the whole matter of teachers' salaries. The remuneration of teachers in country schools is so small that any deviation from due payment of salaries is not only a hardship, but cruelty. Receiving the wages of artisans, they are paid each quarter of a year at the end of their quarter's work. When that is the summer quarter before the summer holidays, and the salaries are not paid even by half-way through the holidays, can anyone fail to see that the anxiety thus caused, together with the impossibility of availing themselves of the leisure of the vacation by travel or other recreation, is not only a personal loss, but also will entail an educational loss in the lack of freshness of their work during the ensuing quarter? Without entering into the question of the "justification" of the differentiation of treatment of council and non-provided school teachers in Merioneth, we venture to say it is a bad business. It is a blot on the national educational escutcheon. It is said that the National Union of Teachers has stepped into the breach and has advanced the unpaid salaries. In doing so the National Union has deserved well of the country.

THE fifth session of the summer school of the Welsh Language Society has been held at Aberystwyth. There were present about 150 students from various parts of the Principality. A large number of the students were assisted by the Welsh educational authorities, and were granted scholarships. The society is now recognised by the Board of Education for grant-earning purposes, and a visit of inspection was paid to some of the meetings of the school by Mr. Thomas Darlington, H.M. Inspector of Schools. The lecturers were Prof. Edward Anwyl, Prof. Edward Edwards, both of Aberystwyth; Prof. John Edward Lloyd of Bangor; Mr. S. J. Evans, of Llangefni; and Mr. W. J. Gruffydd, of Cardiff.

A REPORT has been presented to the Cardiff Education Committee on the teaching of Welsh. The director of education states that, of 24,428 scholars on the register 10,000 were to be instructed in Welsh, the parents of 13,206 children did not wish their children to receive this instruction, whilst the parents of 1,123 expressed no wish either way.

WE have already noted the movement of the Welsh Sunday School Union to establish classes for the teaching of the Welsh language, to be held during the winter months in Cardiff, in connection with the sixteen Welsh

churches in Cardiff. The Union has now asked the education authority to use its influence to have these classes recognised by the Board of Education as evening schools for the purpose of earning grants. Members of the Education Committee pointed out if the classes were only open to the children who belonged to the particular churches concerned, that this looked like a religious test. The committee decided to request the Board of Education to recognise the classes, provided the classes are made available to the public generally.

WITH regard to the allocation of grants for higher education in Wales, Mr. McKenna has made the following statement in the House of Commons: "When the Welsh Department was formed, it became a question, if different regulations were issued in Wales from those issued in England, of how much money Wales ought to get out of the total grants to secondary schools and pupil teachers. The allocation of the grants as between England and Wales on the basis of population would not be a satisfactory arrangement. They had to consider, not only population, but also the number of scholars who had to be provided for. He, therefore, did not take population as a basis, and, in the absence of any other guide, he had for the present year, and perhaps for future years, determined to continue the same proportion as had actually been paid to England and Wales respectively during the last three years. He found, as a fact, that the expenditure in Wales on secondary schools and pupil teachers was $\frac{1}{11}$ th of the expenditure in England—the population of Wales was only something like $\frac{1}{15}$ th or $\frac{1}{16}$ th of that of England—and he therefore thought it right to give to Wales $\frac{1}{11}$ th of the money given to England. Wales had had her full share of the money, and he trusted future Presidents of the Board of Education would always see that she did."

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Lectures Primaires Illustrées. Par E. Toutey. With an Introduction and Vocabulary by H. Bué. vi+185 pp. (Hachette.) 1s.—This is a French school book, the first twenty pages of which are printed with spaces between the syllables, and with devices for indicating liaison and mute letters. As is not unnatural, a book which may be well adapted for the French child is less suitable for the English beginner; this is specially noticeable if we observe the very large number of words taught. The editor indeed maintains that to adapt this volume to the needs of English students "no change whatever has been found necessary"; we hold a different opinion. The French-English vocabulary has been carefully compiled; it is unfortunate that in some cases the order of words is not alphabetical: thus *lieu* to *livre* have inadvertently been inserted between *lourdes* and *lucarne*; and *pourtant* is between *pouce* and *poulailleur*.

La Famille Troisel. By Mrs. J. G. Frazer. xiii+170 pp. (Macmillan.) 1s. 6d.—This original story is an addition to Messrs. Macmillan's Primary Series, and is intended to be read after "*Émile et Hélène*"; the story occupies the first 115 pages and is divided into twenty chapters, a facsimile of a Lettre de Faire Part forming a last chapter of two pages. Corresponding to these divisions come twenty brief and graduated sections on grammar, followed in turn by a score of copious exercises. The grammatical part of the volume is the work of M. L. Chouville, as also is the reform

vocabulary, which excludes elementary words but contains the English equivalents in cases where the explanation in French would only tend to confusion. The story, illustrating many phases of French life, contains plenty of movement, and will certainly induce Mrs. Frazer's "young friends to think that French is nice." M. Chouville has judged well the amount of grammar likely to be grasped by the readers, and has framed the exercises so as to come within their scope. The reproduction of the *pâté* in a letter (p. 14) will not be without interest to young pupils.

Rippmann's Picture Vocabulary. French: Second Series; and German: Second Series. 28 pp. (Dent.) 1s. 4d. each.—This second instalment of pictures needs no further praise on our part; our review of the former series expresses adequately our opinion of the present issue. It is well to point out, however, that illustration 196d is designated *chariot*, whereas it should be *charrette*; nor does 98g accurately represent a *chariot*, as the latter has no shafts, but a beam, and is always drawn by two horses or oxen. In certain districts of France a confusion of terms has arisen, but it is not, presumably, the author's purpose to encourage the use of lax expressions.

French Speech and Spelling: A First Guide to French Pronunciation. By S. A. Richards. 63 pp. (Dent.) 8d.—This carefully graduated little book affords ample drill for the acquisition of French speech sounds, both in the phonetic symbols of the Association Phonétique Internationale and in the conventional spelling of the language. A few diagrams have been inserted in the first part to illustrate the position the lips and tongue assume in pronouncing the different vowel sounds and the *gn* sound. Length of vowels, division of syllables, stress in connected speech, elision and liaison are each dealt with in turn, and suitable selections in prose and verse are given for reading and recitation.

Easy Free Composition in French. By L. M. Bull. 63 pp. (Dent.) 1s. 4d.—In connection with these well-selected stories, the questions and exercises—which should arouse the interest of the dullest—are bound to enrich the pupils' vocabulary and to ensure an accuracy and elegance in expression of thought that have hitherto been seldom attainable.

Free Composition and Essay Writing in French. By A. Philibert and A. Pratt. 88 pp. (Dent.) 1s. 4d.—Students who have already worked through "Easy Free Composition" in this series should be able to start on these descriptive essays. The authors' plan is to give a model, and then to supply a vocabulary of connected words and phrases as useful building material for similar exercises appended. Letters which will be of great help in teaching the various forms of courtesy to be employed in different cases come next. Biographies and literary analyses follow, then eighteen detailed plans and forty subjects of essays, and an appendix explaining the difference between the *Passé Défini* and the *Imparfait*. This capital little book supplies a distinct want in the present state of modern language teaching. The pupils are led up to a fair idea of the "plan," the all-important point in a French "dissertation"; they should now be encouraged to seek for themselves the plans of the authors they are reading.

Bell's First German Course. By L. B. T. Chaffey. xii+104 pp. (Bell.) 2s.—This First Course consists of fifteen lessons, in which a fairly extensive vocabulary is given. The method shows a compromise between the old and the new, and offers no salient features for comment.

The "pages to elucidate pronunciation, though once written, have been cut out, since experience seems to show that pupils do not look at them." Surely this depends on the teacher, and on his opinion of their value. The page that has remained (apparently by an oversight) does not contain much that is helpful. A pupil who is told that for *e* he must have his "tongue point on bottom teeth and arched round palate," and that it is "a close sound=French *é*," may well be excused if he can make nothing of it. The text is of interest mainly for the public-school boy, particularly if he wants to play tennis with Germans who have not yet adopted the reformed technical terms of the game. The examples of German writing are ugly. The grammar is not carefully introduced. Altogether a book which may be convenient for the author in his classes at Eton, but which cannot be warmly recommended as a class-book for general purposes.

Fulda, Das verlorene Paradies. Edited by P. H. Grumann. xiii+194 pp (Ginn.) 2s.—An interesting play, suitable for advanced pupils, who will find all difficulties explained in the notes, and renderings which are generally satisfactory. They will probably make no use of the twenty-six pages of German questions; and the addition of a vocabulary may also be regarded as superfluous in a book of this type.

Classics.

Caesar, Gallic War, Bk. II., xi+19 pp.; Bk. III., xi+18 pp.; Bk. IV., ix+22 pp. By Dr. W. H. D. Rouse. *Virgil, Georgics, Bk. I., xvi+17 pp.; Bk. II., xvi+18 pp.* By S. E. Winbolt. *Cicero De Senectute, xiii+38 pp.* By Dr. J. S. Reid. *Selections from Tibullus and Others, ix+29 pp.* By Dr. J. P. Postgate. (Blackie.) 6d. each net.—No schoolboys, and probably few others, realise the trouble in editing these inexpensive and apparently simple Latin texts. The introductions are short, and mostly terse and clear; there are no notes except a few critical remarks on the readings; but the texts themselves are fresh recensions carefully made by some of England's best scholars, while the marking of all long quantities, whether in position or not before two or more consonants, requires extreme care, and is performed with more accuracy in these later than in the earliest texts of the series. When these advantages are to be had for a nominal price, there is no excuse for using badly printed or badly edited Latin texts in schools. By these editions of Caesar, Dr. Rouse has now completed the Gallic War except Bk. VII.; Mr. Winbolt has already completed the Aeneid and Eclogues of Virgil; and Dr. Reid now adds the De Senectute to the De Amicitia. Dr. Postgate's name adds further distinction to this series; his text gives us eleven poems of the first two books of Tibullus, five of the third book published by Lygdamus, Ovid's lament for Tibullus (*Amores*, III., ix.), and the elegy of Domitius Marsus. The oversights in marking quantities are not many, and are usually obvious, but the following are worth notice: B. G., II., c. 8, § 2, *deiectus* is acc. pl., and the final should be marked long; III., c. 11, § 3 and *passim*, the first *i* of *Aquitania* is long—cp. Tib. I., 7, 3; IV., c. 17, § 8, *drecta materia inecta* is abl. abs.; Georgics, I., 52, *ac* is long; similarly the first syllable of *nonne* in 56; II., 121, *e* in *tenuia* is short—cp. 180; in 277 *ordinibus* has *ð* and *setius* *ɛ*; in 288 *o* in *forsitan* is short, and in 423 *i* of *satis* is long. In the De Senectute we should have in § 36 *instilles*, § 68 *vixit*, § 71 *opprimitur*, and in § 79 *nolite*. In Tibullus, I., 3, 39, and I., 10, 14, is it right to mark the finals of *subiit* and *trahor* as long by

nature? The final of *exiguos* (II., 5, 34) is short. These writers are contemporaries. Why then should we have forms like *omnis*, *admirantis*, *partis*, for the acc. pl. of i-stems in Cicero, and *vites*, *omnes*, *tristes*, *sequentes* in the others? And why *magnō opere* in Cicero, and *magnō pere* (or, as Dr. Rouse has it, *magnōpere*) in Caesar? The reading in B. G., III., 12, *bis . . . spatio* can hardly be correct, but there is no critical note, and that in IV., 3, § 3 seems certainly wrong. There are some differences between this text of the De Senectute and Dr. Reid's edition in the Pitt Press Series. We find here, for example, *adepti* (§ 4) for *adeptam*, and *suasi*, *sed* for *suassim* (§ 14). In Georgic I., 393, *operta* seems a mistake for *aperta*; in 457 the MSS. reading *moneat* should be given; in II., 22, Scaliger's reading is *quas*, not *quos*; in 247 and 341 the old readings *amaror* and *terrea*, usually discarded by modern editors, are restored.

Select Epigrams of Martial, VII.-XII. Edited from the text of Prof. Lindsay by R. T. Bridge and E. D. C. Lake. xxx+128 pp.+text unpage. (Clarendon Press.) 3s. 6d.—This is a useful selection of epigrams, and well annotated on the whole. We should prefer not to have the English paraphrase or abstract of each piece, which only does harm; but the editors do but follow the fashion. The introduction is good. It contains a brief life of Martial—or rather a collection of his allusions to himself—a satisfactory account of his literary qualities, and a few pages on *Patronus et Cliens*, *Captator et Orbus*, *Recitations*, and *Books*, with quotations from Martial at the foot of the page. The chronology of the books is discussed, and the three chief metres of the author. Text and critical notes are those of the Oxford *Bibliotheca*, in which, it will be remembered, is published a school edition of Martial. The notes are original and generally good; we have found little that would be better away, except the English abstracts which have been spoken of above. A few corrections may be worth making. On p. xi, *nulla* has lost its *n*; xxvii and xxviii, the doubtful final of two verses is marked long only, which might mislead the unwary. On p. 1 of the notes, the *aegis* is said to be the "shield" of Zeus originally, whereas it was the cape (goatskin cape) of Athena. P. 4: the *laurea* may be illustrated for English boys from De Quincey's "Stage Coach," a well-known eloquent picture of the days of the French wars. The explanation of *pateras* (p. 3) is only intelligible to those who understood it beforehand. P. 11: *monstra duorum* is not illustrated by the quotations; the difficulty lies in the numeral; "*tuūs*" (pp. 12, 81) is wrong; *-us* is not lengthened at all, its pronunciation is unchanged; but with the pause it takes the place of a long syllable. The introduction, notes, and index are also published as a separate volume at 2s. We strongly approve of this method of publishing notes, and would welcome a volume of notes to the whole of the Oxford school text of Martial.

1. Lucreti Cari de Rerum Natura. A Selection from the Fifth Book, 783-1457. Edited, with Introduction, Analyses, and Notes, by W. D. Lowe. 68 pp. (Clarendon Press.) 2s.—The text of this selection is well suited for its purpose, as having a unity of its own. We should prefer the schoolboy to buy a full text, which he could do for little more than the price of this, the master making the selection; but the separate publication has its conveniences. The notes are fairly satisfactory: the chief fault of their conception is that too much is given; there are too many bits of translation (e.g., 787, 820, 830) and explanations of simple constructions (838, 840, 841, 908,

1034, for example), and much useless information (823 *animal*). On the other hand, one or two real difficulties are insufficiently explained. Thus 844 is hardly right in view of the appositional nominative with *usus* and *opus*; and the alleged lengthening of syllables "by the emphatic beat" (1049) is certainly wrong, for some forms, such as *fulget*, are justified by ancient quantity, others perhaps by analogy aided by the pause-licence. In the introduction, an opportunity was missed of explaining the principle of the Latin hexameter rhythm (p. 6).

Herodotus, I.-III. Translated by G. W. Harris. New Classical Library, edited by Dr. Emil Reich. x+226 pp. (Swan Sonnenschein.) Cloth, 3s. 6d.; leather, 4s. 6d., net.—This is an unfortunate attempt to popularise Herodotus; to make him, as the translator says, "entertaining to the man in the street." The historian would hardly recognise himself as saying (i. 2) "These were possibly Cretans. The Hellenes subsequently initiated a second cycle of outrage. . . . (3) It was merely a case of reciprocated rape. . . . (24) They told (Arion) to jump with all possible expedition into the sea. . . . (60) Men of Athens, receive with a cheerful heart Pisistratus, whom the goddess Athene has so honoured as to conduct him personally back to her acropolis. . . . (ii. 22) Any perspicacious person will admit. . . ." The introduction is childish. The translator's difficulties "are legion and already obvious." Rawlinson's work is, "of course, colossal and scholarly, but archaic." P. Gignet's is "as neat and useful a version as could be expected at the time, but it is, of course, in French." He adds, "comparisons are odious." We are glad indeed to learn that "Herodotus has a distinct sense of humour." He is also like that "worthy medico," Sir Thomas Browne.

Helps to the Reading of Classical Poetry. By L. J. Richardson. viii+68 pp. (Ginn.) 2s. 6d.—This book is an attempt to show how Latin poetry ought to be read aloud. In so far as it reminds readers of the truth, that language is a thing spoken and not a thing printed (pp. 26, 62), we welcome it; that warning is necessary in England as in America: it seems, however, to be specially directed to America, because (we infer) quantity is much neglected in American Latin work. The principles of Latin verse, rules of quantity, and so forth, are very clearly stated, and accurately too: thus the definitions of *thesis* and *arsis* are right (p. 45), while in England these terms are mostly used wrongly. But the explanation is spun out to an unnecessary length. Mr. Richardson's ideas of rhythm in English verse are not clear; no one could read the two lines on p. 10 properly by his directions, and the analysis of "Banks and Braes" (p. 7) is very crude. It may be added that the noun *wind* was never pronounced like the verb *wind* (p. 18); this pronunciation in modern poetry is a mere affectation. The truth is that the verb used to be pronounced as the noun was, not far from the modern sound.

History.

A School History of Surrey. By H. E. Malden. xii+192 pp.—*A School History of Middlesex.* By V. G. Plarr and F. W. Walton. xii+226 pp. (Methuen.) 1s. 6d. each.—Fortunately for our country, it is very difficult to write "school" or any other histories of any of its counties. It would be possible to write a history of one of the old French provinces, and even easier to write one of a German principality down to the French Revolution. Those countries were sufficiently divided, not merely

geographically but historically, to make the history of any one part tellable apart, to a large extent, from that of other parts. But England attained its unity so early, its counties have for so long been for all practical purposes mere arbitrary divisions for administrative purposes, that it is almost as easy to tell the story of one drop of the ocean as to cut out an English county from the main flow of English history. The consequence is that the authors of these two books have the same story to tell. We begin with the Stone Age and end with Victoria, and the peculiarities of each are mainly topographical. Mr. Malden tells of the monasteries dissolved in Surrey, Messrs. Plarr and Walton of those in Middlesex, but the "suppression of the monasteries" is the same for both. We therefore are under the impression that these books are good for the teacher but not quite suitable for the pupil. The teacher should himself be able to localise his English history lessons as he goes along, and the information supplied in these little books will help him to do so, in default of time to consult larger books or to undertake original research. But the books themselves seem addressed to boys and girls, though sometimes the language is a little beyond them. Each has an interesting story, and the work is well done. The illustrations are many and varied, and each is supplied with an index. The title of the second should be "London and Middlesex" rather than, as it stands in the book, "Middlesex, including London," for the greater part of the book is occupied with London; Middlesex is adequately treated in a few pages.

Revision Notes on English History. By F. W. Hadrill. 93 pp. (Methuen.) 1s.—It is a pity that schoolmasters who have a good idea to embody in a text-book on any of the subjects they have to teach do not submit their MS. to some specialist in the subject in order that they may have, before they go to press, the opportunity of bringing their information up to date. Here, for example, is a good little book for practical purposes, covering English history from 1066 to 1832, containing chronological analyses, special notes on many points, short biographies, genealogical tables, and a selection of examination questions—in a word, a useful handbook to put in the hands of our pupils—but every here and there lacking in the latest information. The author "would be very glad to receive notice of any inaccuracies which may have escaped detection"; but why did he not ask for them before printing?

The Children of History. By Mary S. Hancock. 142 pp. (Pitman.) 1s.—An abundance of good pictures, some of them coloured, a pleasantly written and clearly printed text, six pages of "summaries and meanings"—such is the apparatus to set forth fourteen stories of children in history, ranging from Romulus, Cyrus, Pindar, to Brian of Erin and Olaf of Scandinavia. Quite a charming variation from the ordinary readers.

Geography.

The Ambleside Geography Books. By Charlotte M. Mason. (Kegan Paul and Co., and Parents' Educational Union.) Maps and illustrations.—These are new editions of old books. They were originally published by Stanford as "The London Geographical Readers." It is claimed that they have been thoroughly revised and brought up to date. They are issued in five volumes: vol. i., "Elementary Geography" (1s.); vol. ii., "British Empire and the Great Divisions of the Globe" (1s. 6d.); vol. iii., "The Counties of England" (2s.); vol. iv., "Europe" (2s.); and vol. v., "Asia, Africa, America, and Australasia"

(2s. 6d.). This political division of subjects is just the type many reformers dislike. We have seen the first four books. They are interesting, but spoilt, in our opinion, by many blemishes, which really ought to have been removed had the revision been thoroughly carried out. We will note a few. To begin with, not one boasts an index. The pictures of the earlier volumes (there are none in the later) are very old-fashioned. Many of the maps are most repellent and full of confused and confusing details. The numerous questions inserted are almost entirely of the most antiquated mnemonic type, for Miss Mason thinks that the examiners of to-day still require the same sort of geography that was in vogue twenty-five years ago. As to the several books, vol. i., for children of seven and eight years, is full of "easy verses, illustrative of the various subjects." Shakespeare's "Winter" song is one of them; surely the occupation of greasy Joan and the state of Marian's nose might have been left for a more adult age! Questions are set with answers attached, after the way of Mangnall, and are apparently to be learnt like repetition. Vol. ii. is quite behind the times in the spelling of Indian names. Burma is spoken of as if it were not an intrinsic part of India, and Malacca as if it were the chief Straits Settlement. The map of North America shows "Hooker" (!) as the only mountain in Canada, indicates no latitude and longitude, and has not even dots to locate the few towns; New Orleans, for instance, may be situated at the "N" or the "S" of the word, and they are (by the scale) 500 miles apart. The text opposite this map is as full of mistakes as is the map of Africa a few pages before. Vols. iii. and iv. have much reading and little geography. The "Counties of England" should have been curtailed so as to make the book a geography of the British Isles; "Europe" should not have opened with a two-page disquisition on an exploded myth, viz., the climatic effects of the Gulf Stream. Altogether we are not favourably impressed with Miss Mason's new venture. Moreover, the paper is poor, the type worse, and the setting up of the type worst of all.

A Handbook of the British Colonial Empire. By W. H. Mercer and A. J. Harding. 202 pp. (Waterlow.) 2s. 6d. net.—This is really an excellent handbook. It is full of accurate and up-to-date information, as, indeed, it should be, since its authors are respectively a Crown Agent and a member of the Colonial Office. It consists of two parts: (i) five prefatory chapters on the growth of the colonies, their various constitutions, their administration, legislation, and trade; (ii) seven sections dealing with the history and geography of the colonies in detail. The first part—only about one-sixth of the whole work—is extremely interesting, and clearly and concisely written. We commend especially to the notice of anyone who may wish to obtain rapidly a general idea of the matter and method the short summary of the fiscal question on p. 31, of the political and economic importance of our colonies on pp. 7 and 29, and of the colonial lead in social reforms on p. 26. The chapter on constitutions, too, is a good sample of how what is in the ordinary "geography" a somewhat nebulous subject may be clearly treated and made interesting. The second part is a combined history and geography, and good enough in its way—rather dry in the reading and much taken up with the record of facts, and facts only. This occasionally tends to lapse into mere catalogue writing, and as such is, we think, inferior to the work in part i. On the other hand, it is all carefully done, and everything is brought well up to date, particularly on the political and historical sides. Physical geography is, however, weak. In Canada, for instance, we are sorry to

notice that Mounts Brown and Hooker still figure as the highest peaks in the Rockies, and we are sceptical as to the influence which the Gulf Stream is said to exercise on the Bay of Fundy. Moreover, to speak of the tides in the same district as rising and falling 70 ft. is, to say the least, an exaggeration. The engineers of the Chignecto Ship Railway found the extreme range to be 49 ft., and the average spring range just over 42 ft. These, however, are little details which may be toned down in future editions. The one map in the book is most useful; it is a large one of the Empire, showing incidentally, but with very clearly, the principal cables and telegraph lines; two features are very prominent: (i) the inter-connection of colonies and mother country by means of these "nerves of Empire"; only five of our possessions—British Honduras, Tobago, Virgin Islands, Falkland Islands, and British New Guinea—lie outside the charmed circle; (ii) the great trans-Pacific cable from Victoria (B.C.) to Brisbane and Auckland via Fanning, Fiji and Norfolk Islands. Alongside this is rightly inserted the American counterblast from San Francisco to the Philippines by way of Hawaii and Guam. Altogether we have formed a very favourable opinion of the book. It has defects, some of which we have alluded to; there is no index; "England" is used instead of the "United Kingdom"—always a sore point with Scottish readers; details here and there are needlessly precise, and will, indeed, necessitate a very "full" atlas at hand to make all of them intelligible. But we think the work is well calculated—as the authors desire in their prefatory note—to encourage broad views of history and reflection on matters of general interest. It is a book particularly suitable for sixth or commercial forms and special classes.

Mathematics.

Elementary Trigonometry. By Cecil Hawkins. xiv+310 pp. (Dent.) 4s. without Answers; 4s. 6d. with Answers.—This text-book has been written under the conviction that practical field-work should, wherever possible, be undertaken by pupils, and the first eighty pages are largely taken up with the elements of surveying and descriptions of instruments. Chapters iv., v., and vi. deal with the sine and cosecant, the cosine and secant, and the tangent and cotangent respectively, the general definition of the ratios being given in each case, and numerous examples of a practical kind being drawn upon to furnish instances of the use of the ratios and to give facility in applying them. Chapter vii. reviews the ratios, collects standard formulæ, and discusses identities; it also takes up the question of the area of a sector and the limits of $\sin \theta/\theta$ and $\tan \theta/\theta$ for θ converging to zero. Compound angles are treated in chapter viii., and again practical problems are largely in evidence. The two remaining chapters are devoted in great part to problems of a practical nature. It will be seen from this summary that the book differs considerably from those in general use; to many boys we should think the treatment will be much more interesting than that usually followed, and those who work through the course with a reasonable degree of care will have acquired not merely an acquaintance with many interesting and important practical problems, but a sound knowledge of the elements of theoretical trigonometry. With the treatment of details (for example, in the use of the general definition of the ratios from the outset and in the method of establishing the addition theorem) there will certainly be disagreement on the part of many teachers; there may also be a feeling that the practical side is overdone, and that more drill in the mani-

pulation of formulæ and in the solution of equations than the book provides is desirable. But it is to be hoped that a fair trial may be given to the general method developed; experience alone can decide how far it can be carried. In any case, the book is outside the ordinary category, and is the fruit of independent thinking.

A Sequel to Elementary Geometry. With Numerous Examples. By John Wellesley Russell. viii+204 pp. (Clarendon Press.) 6s.—It is refreshing to find a book on geometry that goes beyond the mere elements, and one may hope that the appearance of a new sequel indicates that the more advanced parts of elementary geometry are to have a new lease of school life. The selection of theorems here given will be generally accepted as satisfactory, and the exposition is both compact and clear. Possibly room might have been found for the discussion of anharmonic ratios, but the book contains so much that is good and well expressed that it would be ungrateful to press too hardly for more. We heartily commend the sequel to the consideration not only of teachers, but of authorities who regulate the mathematical studies of the school.

A New Geometry for Middle Forms. By S. Barnard and J. M. Child. xviii+420 pp. (Macmillan.) 3s. 6d.—The general characteristics of the books on geometry written by Messrs. Barnard and Child have been referred to in THE SCHOOL WORLD on more than one occasion. It is therefore sufficient to state that the "Geometry for Middle Forms" consists of parts i., ii., and iii. of the text-book "A New Geometry," with some additional matter. The book is well supplied with recent examination papers.

Exercises in Concrete Geometry, with Supplementary Discussions. By D. Sands Wright. vi+84 pp. (Heath.) 2s.—This collection seems to be more suitable to the conditions that prevail in the United States than to those in force in this country, though the book could be utilised in our schools. It consists to a large extent of examples such as are to be found in many of the more recent text-books of geometry, but considerably more attention is paid to solid figures than in our text-books of geometry (apart from mensuration). The supplementary discussions hardly seem to deserve the prominence that a position on the title-page gives; they are usually quite sensible, but rarely, if at all, do they contain new matter.

Easy Exercises in Algebra for Beginners. By W. S. Beard. x+134 pp. (Methuen.) With Answers, 1s. 9d.; without Answers, 1s. 6d.—This book, according to the preface, "is intended to be the working school book of young pupils, and contains all that is suitable for a preparatory course in algebra." The examples range from the simplest substitutions up to easy quadratic equations; they are numerous, are not too hard, and show a considerable variety. It is rather surprising that, so far as we have discovered, there is no reference to graphs. In Exercise 10 the substitution $z=0$ is given; in four of the examples z occurs as a factor of the denominator, and in each case the answer 0 is given. In Exercise 11 the substitution $x=0$ occurs; and the same error is repeated in two examples, the absurdity being specially glaring in example 11. These blunders are too serious to be passed over without notice.

A Key to Algebraic Geometry. By W. M. Baker. 224 pp. (Bell.) 7s. 6d. net.—For students who are working without the help of a teacher a key, when judiciously used, is of real service; occasionally the hard-pressed

teacher may have recourse to the solution of a knotty problem. This key is, so far as a comparatively cursory examination can test it, compact but clear, and will doubtless prove serviceable. It is often interesting to compare different solutions, and a key can yield in this way some profitable recreation.

Science and Technology.

Builders of the Body. By Eustace Miles and Mariella John. 179 pp. (Philip.) 1s. 6d.—These "lessons on food values" should receive a welcome. Mr. Miles's views on vegetarianism may not be assented to by all readers, but they will be considered with the respect due to an account of personal experience and to the moderation with which they are expounded. The book is, moreover, a sound elementary guide to dietetics in general, and is written in language intelligible to the least scientific of readers. It is illustrated by capital sketches, more or less humorous, which serve to drive home the moral. We notice that the authors follow the multitude in asserting that "oils, starches, and sugar do not build our bodies and repair the waste; they only give energy." Though this is scarcely correct, the error is not, after all, of great consequence in a book intended for general readers. The *Chart of Food Values* (3s. 6d. net), by the same authors, and published by Messrs. Philip as a companion to "Builders of the Body," displays, in a manner which could scarcely be improved upon, the relative proportions of the various food-elements in, and the nutritive value of, common articles of food. The accompanying handbook is extremely interesting. It gives not only several useful recipes, but also instructions for the calculation of the relative values of various combinations of food. The chart ought to be upon the wall of every cookery school in the country.

Philip's Nature-study Pictures. 36 in. x 26 in. (Philip.) 5s. each.—Of the two specimen sheets we have received of this new series we can speak with entire approval. They are well printed in natural colours, and are at the same time accurate and pleasing in appearance. The pictures are in three sets. The first of these, "Studies of Plant Life," consists of sixteen sheets, which illustrate a very judicious selection of types, and, it may be mentioned, include members of most of the natural orders prescribed in the Board of Education's elementary botany syllabus. The second set of pictures deals with "Studies of Animal Life," and illustrates, in five sheets, farmyard and garden life, field life, wood or forest life, pond life, and birds of the seashore respectively. Set three provides pictures of types of the principal orders of insects, with various stages in their development. It consists of six sheets. Accompanying each set is a handbook (6d. or 1s. net) in which the pictures, repeated on a reduced scale, are explained, and descriptions of the organisms given. We have noticed one or two quite minor slips, but for the most part the series of pictures and handbooks are quite trustworthy and to be cordially recommended.

Laboratory and Field Manual of Botany. By J. Y. Bergen and B. M. Davis. viii+257 pp. (Ginn.) 4s. 6d.—As a guide to general practical work in botany, suitable for intermediate students, this book is, we think, the best which has appeared for some years. Histological methods, though by no means neglected, occupy a place of subsidiary importance in the book. By this means room is found for a fuller treatment than usual of the physiology and general structure of plants, especially in relation to environment—branches of which the special educational value is beginning to be widely recognised. A judiciously selected bibli-

graphy is another welcome feature of a book which ought to attain a wide popularity.

The School Garden. By J. E. Hennesey. 155 pp. (Blackie.) 1s.—Managers and masters of rural schools will find in this book an ideal guide to a branch of activity beset with many pitfalls for the amateur. It is above all things practical, and the obvious outcome of wide experience in the work.

A Second Year's Work with Mother Nature. By Alyce L. Sandford. 203 pp. (Pitman.) 3s. 6d.—Mrs. Sandford's ingenuity in devising "correlation" of lessons would surely amaze anyone but an infant-school teacher. Those engaged in such work, who find their imaginations becoming exhausted, will do well to seek inspiration from this book. As in part i., many of the songs are written and composed by the author. Sir John Cockburn contributes a foreword.

Art.

Apollo; an Illustrated Manual of the History of Art throughout the Ages. By S. Reinach. 350 pp.; 600 illustrations. New edition. (Heinemann.) 6s. net.—M. Reinach's "Story of Art throughout the Ages," which appeared about two years ago, has been revised and augmented, and is being issued by Mr. Heinemann under the above title at a considerably reduced price. The point of view, which embraces the whole history of art, architectural, sculptural, and pictorial, from the prehistoric cave dwellers to the pre-Raphaelite brotherhood and beyond, must necessarily be a bird's-eye view; in spite, however, of the amount of ground to be covered, M. Reinach dwells briefly on each important period or style, and keeps up a running fire of most interesting and enlightening comment or criticism. With its 600 illustrations and a bibliographical appendix to each chapter, "Apollo" is invaluable if only as a book of reference, and should certainly find a place in the library of every educational institute in the kingdom.

The Life and Leaf Set of Drawing and Design Cards. By W. Midgley. Ten Cards. (Chapman and Hall.) 2s. net.—The practical utility of such a series of drawing cards as Mr. Midgley's "Life and Leaf Set" depends to a large extent on the method of their employment. If used in the manner directed by the author, and not for the sole purpose of copying, they will form the basis of an extremely interesting and valuable course of study. The series consists of ten cards (11 in. by 9 in.), containing drawings in silhouette form of birds, animals, insects, and foliage, together with suggestions for their adaptation for purposes of decoration. The teacher in search of novelty or inspiration will find them very welcome.

Modern Kindergarten Methods. By Lilian Elliott. 66 pp.; illustrated. (Charles and Dible.) 2s. net.—Much valuable time has undoubtedly been wasted, and countless luckless infants have been unutterably bored, in the name of "Froebel," by the too literal interpretation of his ideas at the hands of unimaginative and unsympathetic kindergarten teachers. Miss Elliott's book is an earnest endeavour to apply the Froebelian principles to a scheme of "gifts" or "occupations," simply and clearly expounded and liberally illustrated, for very young children. Miss Elliott rightly insists that these "gifts" are not to be regarded merely as a pastime; "... All that they can teach, all that they can elicit, must be studied by the teacher if they are to be used as Froebel intended. In a word, the Froebelian letter is useless without the

Froebelian spirit." The study of this little book should conduce largely to a realisation of this spirit, and it may be safely recommended to the young teacher or mother who wishes to gain some insight into Froebel's principles and their application.

Rafia Work. By C. M. Swannell. 48 pp.; illustrated. (Philip.) 2s. net.—Another book which may be cordially commended to the kindergarten teacher is Miss Swannell's admirable treatise on "Rafia Work," which consists of weaving and plaiting with bands of "rafia" or "bast" made from bark fibre. This is an "occupation" which admits of considerable gradation as to difficulty, and lends itself to the manipulation of simple but interesting exercises suitable for infant fingers as well as to the construction of more difficult and elaborate patterns. The book is profusely illustrated with photographs of mats, tidies, baskets, blotters, and an infinite variety of useful articles such as a child would delight to make, together with clear and precise instructions for their manufacture.

Practical Scale Drawing. By A. W. Bevis. 110 pp.; 250 illustrations. (Browne and Nolan.) 1s. net.—This unpretentious little volume is crammed full of useful information and valuable hints on all matters connected with the manipulation of instruments and the setting out and figuring of scale drawings for all practical purposes. The chapters on the construction of scales and their application is particularly lucid; the use of the scale chart for the graphic representation of barometric readings, variations of temperature, school attendances, &c., is set forth in a simple and direct manner, and there are many practical exercises on plotting areas and the co-ordinate method of drawing similar figures as applied to land surveying and similar purposes. The book abounds with illustrations; it is a handy size for the pocket, and should prove a boon to both the student and the teacher of manual training, whilst its surprisingly moderate price gives neither of them an excuse for being without it.

Miscellaneous.

The Psychological Principles of Education. By H. H. Horne. 430 pp. (Macmillan.) 7s. 6d.—"The born teacher may succeed without training: the trained teacher cannot succeed without natural gifts. By natural gifts we mean tact, sympathy with young life, resourcefulness, a sense of humour and a buoyant temperament." If with this quotation before him the reader will dive into Dr. Horne's pages, he will be rewarded; but this dictum is at the back of all. The book deals with the old questions relating to intellectual, emotional, moral, and religious education. It places the true teacher on a giddy pedestal; but from it he can see better into the future. It recommends books; it takes for granted the reader will consult them; it is always bright and hopeful, and it ends on a high trumpet note. But on two points it joins the conspiracy of silence; it will not speak out on the study of habits, and it will not speak out on the numbers of the ideal class. Until writers on education will (following Dr. Stanley Hall) give their full attention to these two points, and will preach, in and out of season, that on a right decision in these matters all progress depends, we shall be sowing the sand. You may, with St. Paul, treat the body as a temple of the Holy Ghost; or you may treat it as an exquisite mechanism not to be fooled with; but you may not neglect to take one view or the other. Similarly with the second question, you may hold that twenty, or twenty-

five, or thirty, or six is an ideal number for a class; but you may not hand a book on the theory of education to a teacher who has to stand day by day before eighty or ninety children. The class which had the Parable of the Sower explained to them numbered eleven.

Physical Exercises. By H. Rippon-Seymour. 127 pp. (Nelson.)—This book is a breezy, sensible introduction to physical training, and its preface is admirable. The writer is English in sentiment as regards exercises, and objects to the monotony of the prolonged Swedish work. Common sense in this, as well as in many other branches of education, is still a desideratum. The teacher who works honestly through this volume will be rewarded. Authoritative measurements (of the normal and most favoured classes) might be supplied by teachers to the Board of Education, and published every three years. We believe this is done in Germany.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

By-Products in a School Laboratory.

NOWADAYS, when "test-tubing" is almost entirely replaced by preparations in a school course of chemistry, a great many by-products are formed. These, I believe, are generally poured down the sink; this seems so wasteful that it would be interesting to inquire if they cannot be utilised.

By-products may be divided, for convenience, into two classes, viz., those which will be of use in the laboratory when recovered and those which can be used as material for laboratory work. Of the former, some are obviously not worth recovering; many of the others are difficult to purify. But is it reasonable to expect the schoolmaster, with his hands already full, to work up these by-products simply to reduce the laboratory account? *A propos* of this, I am reminded of an incident in a recently published book ("Some Founders of Chemical Industry," by J. Fenwick Allen, p. 193). Deacon, the discoverer of the process of manufacturing chlorine which bears his name, one day found Dr. Ferdinand Hurter, his chief chemist, in the laboratory recovering waste carbon bisulphide. "Do you know the value of bisulphide of carbon?" asked Deacon. "No," replied Hurter, "really I don't." Deacon's answer to this was characteristic of the man: "Well, you had better ask, and remember your time is of infinitely more value to me than a few ounces of bisulphide of carbon; and another time evaporate it in an open vessel." This seems to show that unless the finished product is of more value than the time expended on its purification it is false economy to recover it.

Besides time, there are other things to be considered; a substance is only worth recovering in a school laboratory if: (1) it is produced in fair quantity; (2) it is in frequent demand; and (3) it can be purified with the expenditure of very little time. These conditions—especially the last—are all fulfilled in the case of calcium chloride. When I was assistant-master at Sutton Valence, the boys, after preparing carbon dioxide from marble and hydrochloric acid, poured the residues into a large bottle which was allowed to stand some days in a warm place—

either on a coil of pipes or on the top of the steam oven. It is essential that the marble be in excess, for it not only neutralises any free acid, but at the same time precipitates the iron. This impurity, which exists in solution as ferric chloride, is precipitated as ferric hydroxide on standing in contact with the marble. The clear solution is then poured off, and evaporated to dryness when required.

Coming now to the second class of by-products, I wish to point out that many of these—zinc sulphate, copper sulphate, copper nitrate, &c.—afford excellent material for practice in crystallisation. The working-up of a by-product illustrates the uses of crystallisation very well indeed. It also seems less artificial than the usual experiments, in which a boy starts with a solid—say alum—and after making a strong solution allows it to crystallise; some boys, I fear, after obtaining the crystals, feel they have got no further than they were to start with. Boys regard their work from a strictly utilitarian point of view, and unless *they* can see some object in their work are apt to take very little interest in it. Many of the experiments in crystallisation, as I said, seem to *them* objectless; but to purify a by-product, which would otherwise be thrown away, seems something worth doing, and they will work at it with real interest.

Many other by-products, which require something more than crystallisation for their purification, form useful exercises for the upper forms. The purification of calcium chloride, the solution being boiled instead of left to stand some days, is a case in point. The only other instance I will give is manganese chloride.¹ The residues, after preparing chlorine from manganese dioxide and hydrochloric acid, are warmed (in a fume-closet) to decompose the excess of manganese dioxide, and filtered. The filtrate is deep yellow, the pink colour of the manganese chloride being entirely masked by the ferric chloride present. To a portion of this solution—say one-tenth—sodium carbonate is added, the (impure) manganese carbonate being washed on a filter-paper and finally transferred to the main bulk of the solution, which is kept boiling. By this means the iron is precipitated as ferric hydroxide. From time to time a small portion of the solution is tested with a few drops of potassium ferrocyanide solution; at first a blue precipitate is formed; this becomes paler, until finally, when all the iron is precipitated, it is pure white. Such preparations not only afford good practice in manipulation, but enable a boy to realise, what he so often fails to do, that ordinary materials found in nature are not *pure* chemical compounds; and hence compounds prepared from crude materials are always impure.

Silver residues cannot be conveniently treated in a school laboratory. If kept, it is better to sell them when sufficient has been collected; but, considering the small amount of silver salts used in a school laboratory and the low price of silver, it is doubtful if they are worth keeping.

C. H. WRIGHT.

Measuring the Resistance of a Galvanometer (Thomson's Method).

In this method the deflection of the galvanometer has to be reduced. If this be effected by decreasing the E.M.F. of the battery, the variations in the current, due to alterations of the bridge resistances, will be proportionately small; or if permanent magnets be used to bring the needle back to the neighbourhood of zero, then, according to Glaze-

¹ The method of purifying calcium chloride described above is that given in Emerson Reynolds's "Experimental Chemistry," part iii., with the exception of the addition of "a few drops of solution of bleaching lime," which I have found unnecessary. The purification of manganese chloride is taken from Roscoe and Schorlemmer's "Treatise," vol. ii.

brook and Shaw's "Practical Physics," the control field of the galvanometer will become so strong that the instrument will cease to be sensitive.

To overcome the difficulty set up the bridge as usual, but with a fairly strong battery and with the galvanometer rendered as sensitive as possible. Now place a magnet on the axis of the galvanometer coil, and move it about until the needle returns to zero. In this position the magnet will have exactly neutralised the deflecting field due to the current, and the needle again swings freely in its original control field. It is, therefore, as sensitive to variations in the current as it is to small currents in the ordinary way.

This modification may be used successfully with a Thomson or a tangent galvanometer. It is equally effective in rendering sensitive Mance's method for finding the resistance of a battery.

H. S. HAWKEY.

Portsmouth Grammar School.

The New Regulations for Secondary Schools.

I SEE that in your issue of this month you altogether bless the new regulations. May I invite some opinions from other headmasters on two points?

In the first place, is it the common experience that, owing to the presence in increasing numbers of C.C. scholars and to the belief of parents that the old grammar schools are now practically *county* schools—a belief not entirely erroneous—the boarding element in them is rapidly decreasing? If so, the position of the headmaster, appointed on a salary which was fixed on the supposition that he would largely increase it, if efficient, by the boarders he could attract, is altered much for the worse. My own experience in seven years has shown that as C.C. scholars go up boarders go down; and the 25 per cent. clause will add to the actual numbers of boys from elementary schools and announce to parents still more emphatically the further democratisation of these grammar schools.

Secondly, is not the liberty to vary the curriculum somewhat of a delusion in the ordinary grammar school of 100 to 150 boys? So long as parents demand a variety of subjects, each boy in such schools will be taught far more subjects than are good for him if the numbers in the school and the constitution of the staff do not permit of the boys being sorted into "sides" according to their tastes and capabilities; and these are the conditions that necessarily prevail in most schools of this size.

HEADMASTER.

The International Congress of School Hygiene.

As a slightly incorrect statement has been published, it would be well to explain in some detail the important new move in the matter of school hygiene which was taken at the closing meeting of the recent International Congress.

The permanent International Committee, consisting of about sixty members selected from almost every country, has hitherto only met during congresses. Arising out of the question of whether it would not be a proper thing to establish a bureau, with a permanent staff, library and museum, and so on, in some central but neutral spot, such as a Swiss or Dutch town, it was decided, as explained by Drs. Mathieu, Burgerstein, and Kerr, that it would probably lead to greater progress if such bureau was not localised, but if each country had its own centre for the diffusion of knowledge, and to act as a clearing-house in the matter of school hygiene statistics, laws, and regulations. Finally, to supervise in scientific matters and generally to do all that is possible at all times or places to forward the human interests which are bound up in

the special lines of knowledge included in school hygiene, the International Committee has formed a small council.

This council has all the powers of an ordinary committee. It can form sub-committees of experts on special inquiries. The usual committee procedure is to sit round a table and discuss matters, but this council will deal with the various subjects that arise, submitting the different topics by correspondence, collating the answers, and finally making pronouncements in urgent matters after a meeting of the council.

It is obvious that for efficiency such council should be small and yet have the elements to secure permanence, and at the same time possibilities of slow but constant change. This has been done by deciding that it shall consist of the president of the past congress, the president of the congress which has just been held, and the president of the next congress. Nine other members are to be elected, of whom three are to be from the country where the congress was last held and three from the country where it will be held next, three being selected from other lands.

Certain matters, for instance, will almost at once come under the consideration of this council. Such might be quoted as:

"The question of how medical inspection of schools can best be carried out with the maximum of efficiency and minimum of cost."

"The question of how the laws of health can best be imparted to the coming generation, so that later they will know how to care for themselves and those dependent on them."

"The best systems or methods of physical training for both sexes at various ages."

"The feeding of children requiring proper nutrition, so that it shall be done without developing pauperism and with regard to those upon whom the cost falls."

These four matters are being dealt with practically in a great variety of ways, and this council should be able to collect and analyse known facts to show which methods are best for any town or State.

It is obvious that information thus digested will have a very great value politically as well as educationally, and this council may in time come to be officially regarded as quite analogous in matters of school hygiene to that other Congress of Peace now in session at the Hague.

LAUDER BRUNTON (President), JAMES KERR, E. WHITE WALLIS (Hon. General Secretaries).

The School World.

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All contributions must be accompanied by the name and address of the author, though not necessarily for publication.

English History

The Average Pupil's Most Fascinating Subject



IT is, of course, well known to the readers of this journal to what extent the fascination of English History exercises itself upon the average boy. If one were to ask several classes of boys of from, say, ten years upwards, what was their pet study, "History!" would in most cases be the unanimous response.

And History is a subject upon which one finds oneself woefully and embarrassingly ignorant in after years, which very likely is due to insufficient ground-work on the part of one's early teachers.

Although

NEWNES' NATIONAL EDITION OF GREEN'S SHORT HISTORY OF THE ENGLISH PEOPLE

is primarily intended for the average layman of mature intellectual growth—for the clearing away of the cobwebs that have accumulated in his brain attic—this admirable work has been so enchantingly written as to invest the subject with all the glow and glamour of the richest realms of romance. And, indeed, the language can give us no more thrilling a "story" than this same English History of ours. Yet, unless presented in some such alluring form as that chosen for the style of GREEN'S SHORT HISTORY, the salient points can scarcely be as indelibly impressed upon the expanding mind of youth as would be desired.

GREEN'S SHORT HISTORY is more than readable. It is charming. The illustrations are very numerous (many in colours) and beautifully executed. To its production have been devoted the best efforts of the greatest of modern historians; and there is no history obtainable to-day that is so accurate and authoritative.

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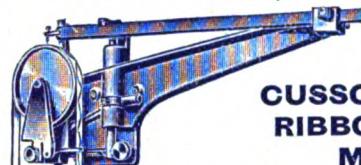
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SIXPENCE.

REVISED VIEWS IN HISTORY.

By A. J. EVANS, M.A.

I.

IT is now nearly a century since Sir Walter Scott, turning from poetry, began to write that series of Waverley Novels which aroused interest in history, and started men on attempting to understand the past in a way they had never before realised. It is said that it was from a perusal of "Quentin Durward" that Ranke, the German historian, obtained his inspiration to get at the truth concerning Louis XI. of France. Since that time, history, as a pursuit of truth and an endeavour to set it forth, has progressed far. For a time it was still used, as it had been used before, for polemical purposes. Hallam and Macaulay told the history of the Stuarts in order to answer the Tory history of Hume and to justify the Whigs of 1832. But the study of documents, which Ranke had inaugurated, which our English historians have pursued, and which has now become the life-work of many a student, has at last had results. In the work of our modern writers, both those still living and those but recently departed from us, there is evident no longer the desire to see "new foes with old faces," but the attempt to tell the story of the past as it was, or, if there is any bias, it is towards telling that story as it appeared to the actors thereof, without any consciousness of nineteenth- or twentieth-century ideas or aspirations.

Thus, much to the confusion of those who still abide by the old text-books and authorities, there has come about a bewildering change. Not only has the need for verification destroyed many of the old stories that used to be regarded as gospel truth, and are still too "pretty" to be entirely discarded, but the whole spirit of the history is changed. Not what we should like to find in order to support our own theories, ethical or political, but what we can find without regard to any pet theories, now occupies the best work of those engaged in research. We must, therefore, change our attitude towards the new truth. As the late Prof. Seeley said, "When a man says he is not interested in history, it does not occur to me to alter history. I try to alter him." We may sum up the advance in two phrases: more knowledge, new ways of interpreting knowledge. In what we have to say, we shall speak more of the increase

in knowledge, but we shall have something also to say of new views.

First, we have advanced beyond the Freeman and Green method of thinking of ourselves as pure Englishmen, and we find it necessary to begin our history as far back as possible. Even if we ignore Palæolithic and Neolithic man, we must study the "ancient Britons" and their varieties, the Scots of Ireland and Scotland, and the peoples with whom they had to do. In a word, we no longer ignore the "Celtic fringes" of Anglo-Saxondom, but realise that Scots, Irish, and Welsh are parts of ourselves, to say nothing of what British blood may have descended to Englishmen from those whom they did not entirely exterminate in the sixth and seventh centuries. While we do not go so far as to believe that the Cymry finally triumphed over the Saxons at Bosworth Field, we no longer regard as negligible such men as the Llewellyns or Owen Glendower or the Tudors. Was not Henry VII.'s eldest son called Arthur with express reference to the legendary King Arthur of Geoffrey of Monmouth and Malory? The archæologists have revealed to us in coins much of the period between Julius Cæsar's visit and the beginnings of Roman conquest. The world of Cymbeline and Lear is partially revealed. Much light has been thrown by Mommsen and others on the Roman world of the four centuries during which Britannia lasted, and we therefore know more of the Roman province of Britain, though even so there is not much to tell beyond the story of the conquest, and the local results of the breakdown of the empire in the latter part of the fourth century. We believe in the Christianisation of Britain, less from stories of St. Alban and of Glastonbury, and more from general considerations such as the establishment of Christianity by Constantine (*circa* 320) and following Emperors.

Over the two centuries that elapsed between the withdrawal of the Roman legions and the coming of Augustine the cloud of ignorance is still almost as thick as ever. We can only know that the dates which we used to learn for the foundation of the seven kingdoms, much more the names of their founders, are quite uncertain. An attempt was made a few years ago to inaugurate a theory according to which our civilisation is mainly Roman by direct descent from the period of occupation, especially in the cities. But the evidence for this is too scanty; the probabilities have been

thought too slight, and this theory has not obtained the sanction of historians in general.

But a few dates are known. The battle of Deorham (577), which cut off the Welsh of Wales from those of Cornwall, and the battle of Chester (613), which cut them off from those of Strathclyde, are the most important. Topography, the position of forests, marshes, and river valleys, is the basis of what conjectures are now considered most probable as to the course of the Anglo-Saxon conquest.

With the coming of Augustine, the Middle Ages begin for English history, that period of European history regarded by our eighteenth- and early nineteenth-century historians as an age of "ignorance and superstition," from which the philosophy of modern times had delivered Europe. There may be some exaggeration in the reaction from this view, but since the beginning of the Tractarian movement (1830) and the restoration of the Convocations of the English Church in 1852 to at least regular meetings, we have learned to look with different eyes from those of our fathers at the period during which Europe was consciously a Church and England a part of that Church. This is not the place or time, though the temptation is strong, to dwell on the phenomenon of the Church-Empire whose name was Rome, and which had two heads, the Emperor and the Pope. But the constant struggle, conscious from the time of Hildebrand and William I. of England, between the various ecclesiastical and lay institutions of that period, between Pope and King and clergy in each kingdom, to say nothing of parliaments and general councils, has become more prominent in our modern text-books, and is, indeed, the key to the whole history of the time. Specially does it help us to understand the long, monotonous reign of Henry III., that period which stretches from John's "submission" in 1213 to the meeting of the "Mad" Parliament of 1258, and during which the Pope was not merely head of the Church, but also feudal lord of the realm.

Of the five centuries of contest between English, Saxon, and Dane, we have little to say. The term "Bretwalda" is no longer regarded as more than a title given by later writers to whatever king happened to be predominant for a time. The work of conversion is now attributed fairly (except by polemical writers) to both Celtic and Roman Churches. The parochial system grew gradually, and was not the work either of Theodore or of any one man. Care should be taken not to make the reign of Egbert of Wessex too much of a dividing line. There was still lack of unity, especially between north and south, and the division was accentuated by the first Danish conquest. Opinions still differ about Dunstan and his treatment of Edwy. But his character has, on the whole, risen, and there is due appreciation of the monastic revival of his time. On the other hand, Freeman's glorification of the Godwin family has been modified, and Harold is not the pure saint he used to be.

Much advance has been made of recent years

in the study of feudalism and of Domesday Book. The results are as yet too chaotic and too technical to have place in books written for school children, but we may say that the old simplicity has disappeared. It was a system (if a system at all) of contracts of infinite variety, so that a man might be a villein in respect of one piece of land and a freeholder in respect of another. A given plot of land, too, might be held as a tenancy in chief, in eleemosyne, and in socage, all at the same time. Life was not simple in the Middle Ages.

We return to matters more practical to teachers in directing attention to the work of our three greatest mediæval kings, William I., Henry II., and Edward I. The details of their activities may be found in the best text-books, and we need do no more than characterise their contribution to the history of our constitution. William gave us a strong central administration to add to the local institutions of our Saxon kings; Henry united the two in the institution of the Angevin shire moot. Edward gave shape to the development of this institution into the national Parliament, the history of which henceforth is the centre of our domestic history. The old fashion of giving in a few words the "character" of each of our sovereigns is happily dying out, though not yet dead, and it does not seriously matter whether these improvements were made from "good" or "bad" motives. Probably the actors in these revolutions were not so much aware of the greatness of the changes they effected as we are to-day, looking back on their work and its results. The English constitution has been happily defined as a series of remedies for grievances, and the Exchequer, the assises, and the "model" Parliament were no more than the most practical means of overcoming a pressing difficulty. It must not be forgotten, too, that each of these kings had predecessors who showed them the way. William had Canute, Henry II. had Henry I., to whose reign it is now being discovered that we must attribute some of Henry II.'s changes, and Edward I. had Simon de Montfort.

Simon de Montfort was a Frenchman (how should his name be pronounced?). It was he and his friends who first introduced French into State documents. All previous ones had been in either Latin or English. He, too, found a remedy for a pressing want, and called members from cities and towns to his party assembly of 1265, but he did not find the House of Commons. We doubt if he ever conceived the idea.¹

The history of the growth of our constitution may be presented in outline in the following way. William I., posing as an English King and lawful successor to Edward the Confessor, maintained the shire moots and other local institutions, and these underwent only the change in language and

¹ How much better it would be for us now in India if the story of the slow growth of the House of Commons and of its powers had been taught in Calcutta University instead of the Whig notions of our history as presented by Hallam and Macaulay, which evidently form the stock-in-trade of the agitators there. They might have learned how many centuries of local government are necessary before a national parliament can be even conceived.

spirit which were the necessary result of administration by Normans more conversant with Continental than with English customs. To these he added, or at least developed from previous embryos, the Exchequer and the Curia Regis, as central machinery for taxation, general administration, and whatever legislation was required. The relationship between the Crown and these bodies depended entirely on the personal character of the monarch. William II. developed the advantages of his position as national King and feudal lord until he earned the dislike of all, and Henry I. could gain support for his "usurpation" by granting a charter and making a beginning in that union between central and local administration which was carried so much further by his Angevin namesake. Under the "soft" rule of Stephen all was lost, and Henry II. had to begin again, to restore and improve the work of the Norman kings. Hence the "assises" of his reign, and the system that was elaborated in connection with them. He sent the itinerant justices—members of the Curia Regis—to preside at extraordinary meetings of the shire moots for the purposes of taxation and civil and criminal jurisdiction. The sheriff was their executive officer, and the use of juries—sworn witnesses—was developed for the purpose of settling disputes, assessing taxation, and "presenting" criminals. "Personal" taxation was introduced as an additional source of revenue to the feudal aids, and thus the Angevin shire moots may be regarded as petty parliaments, having at least the embryo of all the functions of fuller national Parliaments. The new system was strained by Richard I. for his crusade, and by John in the stress of struggle against the two most powerful monarchs of his time, Innocent III. and Philip Augustus. The consequence was an alliance of the nobles, who alone had suffered from previous kings, and the growing class of merchants to force from John the granting of Magna Carta. During the long stress of Henry III.'s reign, the latter class was growing in wealth and intelligence—was not the period that of the Friars and the Universities?—and after the middle of the thirteenth century we begin to see the "Estates" of the Middle Ages, clergy, nobles, and commons, shaping themselves for representation in the "jury of the realm," the Houses of Lords and Commons with which we are familiar.

We have learned much in recent years of the difference between written and unwritten constitutions, and we have been taught that the British constitution is unique in this respect. We have at two periods in our history attempted to make written constitutions. The first period is in that century that saw the gradual coming into existence of our national Parliament. The second is in the seventeenth century, when the relations between the Crown and the Parliament were keenly discussed. There are three mediæval documents: Magna Carta, the Provisions of Oxford, and the Ordinances. All three are alike in this: that if they had succeeded in getting

established, they would have substituted for the national Parliament that was then evolving an aristocratic feudal body as a check on the King. They all perished, the two latter entirely, Magna Carta only in respect of its constitutional clauses, and that within a very short space of time. The importance of even the mutilated Magna Carta that survived the changes of Henry III.'s reign was not discovered until the seventeenth century. Then what was important of it was provided with sanctions, Habeas Corpus Act, &c., which made it for the first time really a law that could be enforced. The many promises to observe it prove only how weak it was in the Middle Ages.

There is another mediæval document of constitutional importance about which much confusion still apparently exists. What Edward I. ratified at Ghent in 1297 was the *Confirmatio Cartarum*, a French document with a Latin title which was regarded by the seventeenth-century anti-Royalists as a statute. Another document, often confused with it, is the so-called "Statute" *de tallagio non concedendo*. Dr. Stubbs long ago printed both and pointed out their distinctness, and a comparison of the sixth article of the former, phrase by phrase, with the first article of the latter (an unauthorised and inaccurate report), would be a profitable exercise for our elder pupils. The authentic document has a "saving" clause which much modifies the scope of the charter.

Another subject which has lately come into prominence has been the importance of sea power, and this has affected the history of all wars in which England has been engaged. More important, perhaps, than Crecy or Poitiers, regarded from the military point of view, are the battles of Sluys (1340), Lespagnols-sur-Mer (1350), which gave the command of the sea to the English, and of La Rochelle (1372), in which we lost that command. Raids in France were useless unless we could land where we pleased. Minor legal points in connection with the Hundred Years' War, which have received attention lately, are the occasion of Edward III.'s claim to the French crown (a mere device to please the Flemings) and the discussion about the Salic law. It was only the lawyers of the next generation who imagined that the French barons of 1330-40 quoted any imaginary law of their supposed forefathers to settle the succession to their crown.

The story of the Peasants' revolt has been rewritten; its causes, economic, political, and financial, have been explored. Wat Tyler, as we used to know him, almost disappears, and the insurrection should be compared with the almost contemporary French Jacquerie, and connected with the later revolts against enclosures.

The periods of Lancaster and York have not been much changed in our histories as yet, partly because material is wanting or unexplored. Perhaps some day we shall have something which will relieve the deadly dulness of those

faction fights known as the Wars of the Roses. Meanwhile the discussion turns on the relative importance of the military details, a discussion with which school teachers, under the dread of examinations, have unfortunately nothing to do. The numbers of the armies are generally believed to be exaggerated.

Henry VII.'s reign has been rescued from the Bacon and Hallam traditions. He was not so parsimonious as was supposed. He amassed wealth, it is true, but could spend it when wanted. Morton did not invent the fork; the dilemma was invented by Fox as a reply to the converse proposition put forward by certain clergy who were being asked for taxation.

In the beginning of his constitutional history, Hallam states that there were, in 1485, five "essential checks upon the royal authority," which may be thus summarised: Consent of Parliament is necessary to (1) taxation, (2) legislation; (3) personal freedom and (4) trial by jury are guaranteed; and (5) there is no special protection for State officials. But, immediately after elaborating and explaining the first two, he proceeds to say that "no adequate redress could be procured" for violent acts on the part of State officials, and that juries were intimidated to give verdicts satisfactory to the Government. In the first paragraph, Hallam is a Whig lawyer, pleading for some fellow Whig accused of libel by a dictator like Pitt in, say, 1800, quoting all the statutes and judges' decisions he can lay hands on in the Middle Ages. In the second, he remembers that he is a historian, who must say what did happen, not what ought to have happened. It is his lawyer ability which has given him the epithet "judicious." It is the fact that only by an after-thought is he a historian that makes him so unsatisfactory a guide.

CLASS-ROOM PHONETICS.

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King's College School, Wimbledon Common.

I.

THE OBJECT OF THE ARTICLES.—Many teachers who have gone far in the theory of phonetics find difficulty in applying what they know to be the needs of the class-room. There is a danger of teaching phonetics for the sake of phonetics and not for the good of the language. The difference between studying the subject and getting others to study it is quite as much felt as the fact that the theory and detail dear to the heart of the specialist are not what the pupils in a school require. Moreover, the delivery of lectures and the conduct of a lesson are as wide apart as the poles.

Again, there are in these days of transition from formal method, or from informal lack of it to the human and scientific Reform Method, a great many schoolmistresses and schoolmasters who, in addition to taking a form "in ordinary

school subjects," are compelled to teach languages, who desire to teach them well, who are in sympathy with the objects of the "Neuere Richtung," who have studied phonetics to the best of their abilities, but who have in their minds no definitely formulated plan of teaching, and may even in some cases be nervous about formulating one.

Without being able to lay claim to any special degree of stupidity I may say that it took me several years to learn how to teach phonetics so as to get accurate results, to interest the class, and to impress the memory. It is to others who have found similar difficulty that these notes are addressed.

I have given here a minutely detailed series of lessons. To some they will afford only a new hint here or there; to many they should save several hours of laborious preparation. I imagine the notes used on the following lines. First the production of speech is studied; next the details of spoken English as the "known"; from which we go on to the unknown sounds of French or German, noting in those languages the sounds which we possess before taking those we do not possess. The lessons will be constantly revised and exercises given, the class being encouraged to invent new exercises and to make at all times original observations.

I lay stress on one or two points of a general character, and first as to the time to be given to phonetics in school. Given that the acquirement of a good accent is an essential, I consider, as the result of personal experience, that at least ten full periods of half an hour or three-quarters of an hour should be given to the subject when first taken up, and that two periods of ten minutes a week should be set aside for revision during the subsequent years. This is quite apart from the use of the Lauttafel as a corrective to pronunciation.

It will probably not be possible to make the school lessons coincide with my divisions. The amount taken on each occasion will vary with the master, the school, and the form. I have in the course of the lessons made a speciality of blackboard work. Good blackboard work is rare. I have found in a varied experience of England and the colonies that most blackboard work is either muddled, untidy, or indistinct. It becomes an evil by confusing the learner. In most cases the writing is not sufficiently heavy to draw the attention. Yet blackboard work does much to make a bad lesson interesting, and to make a good lesson brilliant.

Before proceeding to the actual lessons, I should like to lay stress on the fact that I am presenting here an elaborated version of my own class-room notes. I have taught from these notes, and constantly revised and amended them. I have, of course, made use of every hint given by the great phoneticians. It would be impossible to acknowledge every hint I have taken; reading much, I forget often where a certain idea has come from. But I do lay claim to the general

thinking out, methodising, building-up, and originality of the scheme as a whole. I will now pass to the notes themselves.

LESSON I.

Apparatus required.—Either a model of the speech organs or a chart to show clearly and simply the position of the organs. A rough working model to illustrate the action of the vocal chords. Large diagram to show the position of the tongue in forming the sound given by the class. Coloured chalks.

I. Get a pupil to pronounce a vowel sound, any vowel sound as used, for instance, in a singing exercise. This procedure gives a reasonable chance of a pure vowel being given at once. If a pure vowel is not given at the first attempt, go on until you get what you want. Do not supply the sound yourself. Suppose the sound when given is *a*. Let the whole class pronounce it and ask them to try to find out what they do to make it.

II. Try to elicit by questions the organs used in producing sound *a*. Do you use the lips? How do you know? If you change the shape of your lips would you get the same sound? Do you use the tongue? What part of the tongue? Does it touch anywhere? Where? What part of it touches? (Questions to determine the vibration of the chords, use of breath, path of breath.) Could you make the same sound with your tongue in any other position? Without the humming in your throat?

III. Make a summary on the blackboard of the organs used in producing the sound *a*. Revert to the fact observed that difference of position makes difference in sound; get from the class the conclusion that each sound is produced by one, and only one, position of the respective organs.

IV. Draw or hang up a chart of the vocal organs, pointing out those used in saying *a*. Direct attention to the fact that there are still some parts of the chart which are not used in pronouncing *a*. Ask the class to breathe and see by what path the air escapes. Some will say, "Through the nose"; others, "Through the mouth." Ask them whether they can breathe through the mouth or nose at will, and suggest to them a man breathing smoke through nose or mouth. Ask how it is done, what enables us to alter the path of the air. Point out the velum on the blackboard or chart. Next ask them to say *a* without the humming in the throat. Some may answer that it is impossible, which will be correct. Explain that you want them to try to say *a* without a humming, even if the result is not *a*. Ask them how they would make a humming without using the throat, how the wind makes a humming in telegraph wires. Ask them what they think there is in the throat to make that humming. Produce the rough working model of the rings, and show how the chords relax and

tighten. Give a simple description of the chords. Draw on the board the diagrams from Mr. Dumville's book ("French Pronunciation," &c., Dent, 2s. 6d.), to show how the chords can be wide apart or close. Ask what the results of these varying distances will be? To prove the truth of the stretching and slackening, put your finger on or under your thyroid cartilage and press down or up, speaking at the same time to show how the chords (and therefore the pitch) are affected.

V. Let the class make an examination of their mouths with hand-glasses.

VI. Tell the class that you want them to help you to make a map of the positions the tongue takes up in different sounds. Draw an exaggerated diagram of the interior of the mouth on the board. Point out that to be accurate you must fix on one part of the tongue and ask them to imagine that a drawing-pin has been driven into the middle of the tongue. Ask them to tell you roughly whereabouts the drawing-pin would come in the mouth in saying *a*. Correct their observation by the Lloyd diagram (enlarged copies of which can be made from Rippmann's "Sounds of Spoken English," Dent) of tongue position of *a*, and make a mark in, say, light green chalk inside the diagram of the mouth to show the place of the drawing-pin in the tongue.

VII. Ask for some more vowels. If the pupils are North British a pure vowel should be given without much delay. For the most part, however, vowels-plus-vowels or vowels-plus-consonants will be given. Take such sound groups, and ask the class to listen while you say them slowly; then ask them how many sounds there are in each. Say that you want single sounds, not groups of sounds. (I have found this one of the points that want most attention in dealing with English boys.) Take again the sound group *ej* or *ow*, and extract the vowel from each. Get the place of these fixed, as in the case of *a* marking in their places with the colour you intend to use for each. To get the other vowel sounds of *i*, *e*, *a*, *ɔ*, *u*, give the class sets of words containing the sounds, such as *marine*, *bet*, *far*, *cot*, *lagoon*, and have the required sounds extracted, and the tongue positions marked by different coloured dots on the chart of the mouth.

VIII. The class should now be able to point out as the results of observation the angular (I find vowel triangle a misleading term) path of the imaginary drawing-pin in the tongue, and the fact that the tongue recedes and falls, recedes and rises, in the mouth.

IX. Put up a series of words to illustrate the inconsequences of spelling, such lists as *through*, *plough*, *cough*, *hough*, &c., and *I*, *ay*, *eye*, *high*. Ask the class their opinion of spelling as a guide to the sound of a word and *vice versa*. Ask them what would be their idea of a perfect "alphabet." Explain the point and value of phonetic script, and then go over the ground already covered, replacing the coloured chalk marks by the script

for the sounds taught, keeping to the same colours.

X. The final appearance of the diagram will then be as in Fig. 1.

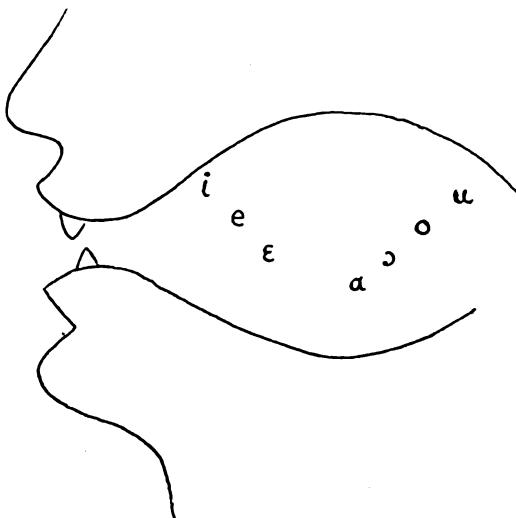


FIG. 1.

To make sure that the script symbols are being remembered, write them down outside the chart in any order, preserving the proper colours, and proceed to drill the class on them.

USE OF THE BLACKBOARD.—I have found by experience that blackboard notes are most effective when nothing is left on the board except what is absolutely wanted for the summary. Where a summary and a diagram occur side by side it is well to keep one side of the blackboard for the notes and the other for the diagrams. If I may be allowed to suggest it, I think that in all forms of blackboard work we may get useful and brilliant hints as to the catchy presentation of facts from good modern advertisements, more especially the American. The use of coloured chalks, of alternating capitals and small print, of sentences grouped in peculiar positions, and, in a word, of the blackboard as if it were a hoarding used exclusively for the advertisement of only one commodity, will arrest attention and help memory without forcing it.

LESSON II.

Sounds to be taught: i, e, ε, a, ɔ, o, u.

Apparatus required.—Chart or model of speech organs. Dr. Lloyd's diagrams of tongue positions for vowel sounds.

This lesson may appear to some a mere repetition of the preceding one, in that the sounds to be taught are the same in both. I would point out, therefore, that so far only the tongue positions for those sounds have been given, and that not too emphatically, and that the revision of Lesson I. with the additions contained in this lesson will give the class a sound understanding

of the production of these vowels, to serve as a basis for the less definite English vowel sounds to be taught in the third lesson.

I. Recall again to the memory of the class, either by questions or by statement, that few sounds in English are pure vowel sounds. Ask for a few really pure vowel sounds. Take a again and place it in its proper position in the chart of the mouth. Then give the a sound. Ask the class to give you the tongue position of this. Help them to make it accurate. Then face the class and tell them to watch your lips when you pronounce a and ε respectively. Get an accurate observation, and note on the board opposite the coloured chalk symbols of these sounds.

II. Next, standing sideways, pronounce a and ε and tell the class to observe the angle of your jaw. Note the differences on the blackboard by two angles drawn in the respective colours of these two sounds. Treating ɔ in the same way, get the description of narrow and wide sounds.

The next step is from a to ε to e,
and from a to ɔ to o.

This shows further narrowing.

Finally the step from e to i
and from o to u

shows the greatest narrowing.

III. Hang up the Lloyd diagrams in a row, in order of tongue movement, so as to enforce the idea of a definite path; then arrive by questions at the fact that in all vowels the air passes out through the mouth, and that the chords vibrate, that the sounds, therefore, are obtained by the air being "moulded" by the different hollowesses of the mouth, differences produced by the positions of the tongue.

IV. Write up a series of words to illustrate each sound taught, each series to appear only with the particular sound it contains and illustrates,

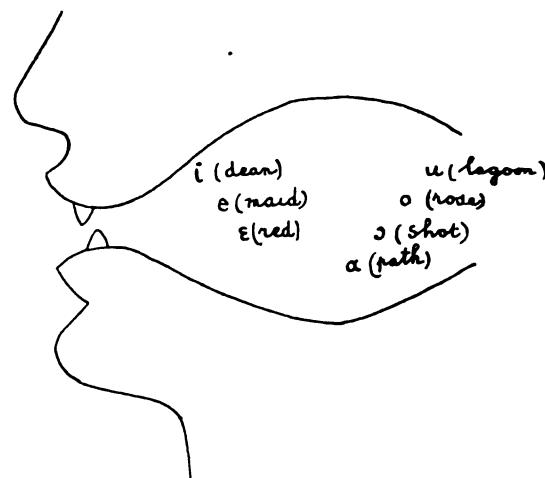


FIG. 2.

and to be rubbed out before the next series is put up. The lists of words should be supplied as much as possible by the class.

V. Write up the script symbols for the sounds

taught, in any order, and make the class read them off in any order individually and in chorus, insisting on absolute accuracy, and, if necessary, going through the production again. Give the chalks (coloured) to various members of the class, and tell them to write down sounds at your dictation.

BLACKBOARD WORK.—As you take each sound in this lesson write it in its proper position in the diagram of the mouth, together with a word in which the sound occurs. The blackboard will finally appear as in Fig. 2.

Next these sounds, with illustrating words, one to each, might be written again on the blackboard in their respective colours. To distinguish the narrow and wide, narrowest and widest, some such device as this might be used: WIDEST, wide, narrow, NARROWEST; or a grotesque head might be drawn with each group to show the varying opening or closing of the mouth.

LESSON III.

Apparatus required.—Chart of speech organs; Lloyd diagrams for the tongue positions of i, e, ε, ə, ɔ, o, u.

REVISION.—Revise Lesson II. by questions, and draw the chart of the interior of the mouth as appearing finally in Lesson II., together with the diagram of open and closed sounds.

Sounds to be taught in this lesson: æ, a, ʌ and ə, ɪ and ʊ.

I. æ. Ask what sound there is in words like *bat*, *lad*. (Guard against the possible North British pronunciation of æ as a by saying these words yourself several times.) Place this æ sound by experiment, by contrasting it with other sounds already known. The class should be able to place it between e and ə without much difficulty. When placed, put an illustrating word against it.

II. ʌ. Ask for the vowel sound in *but*, *much*. Some may give the sound group juw; to these renewed explanation must be made that juw, ow, &c., are not single sounds, but combinations of sounds. Place the sound ʌ in the chart, proceeding as in the case of æ.

III. ə. Ask the class to give the vowel sound in the second syllable of *butter*, *mother*. Place it by experiment. (*Note.*—In the script of the Association phonétique internationale the symbol ə is made to do duty for the last sound in the English *mother*, as well as for the last sound in French *le*, and German *Dame*. Numerous rough experiments with my own speech and other people's have confirmed my opinion that the French and the English sounds are not the same, the last vowel sound in *le* and *Dame* being pronounced with the tip of the tongue slightly more forward in the mouth than when pronouncing the last vowel sound in English *bother*, *mother*. This may seem a needless detail, but I have found by experience that in teaching English phonetics first, and dealing with the sound ə as that of the last sound in *butter*, &c., many of my pupils when they came to

read the symbol ə in French phonetics have had a strong inclination to make the sound approximate to a, thereby bringing confusion into the genders *le* and *la*. The similarity in form would also appear to be an argument in favour of a better differentiating of ə and a. The confusion may, of course, have been the result of dull or confused teaching on my part. I took special care to be as clear as I could, however.) Finish the treatment of this sound as in preceding cases.

IV. a. Proceed as in the case of æ, giving a word in which the sound occurs, &c.

V. ɪ. Obtain this sound experimentally by pronouncing i as taught and known, and then drawing back the tongue very slightly. Get the class to supply words in which the sound occurs. Place in the chart. Treat as in the case of other sounds.

VI. u. Treat as in the case of ɪ.

GENERAL.—Use the Lloyd diagrams to show where the tongue is in the various sounds given. Practise the sounds taught as written in the chart on the blackboard.

Write up the script for these sounds in any order, and make the class or individuals read them off. Special colours should be given to these sound symbols.

Give the chalk to various members of the class, and let them write the sound symbols of the sounds you pronounce for them.

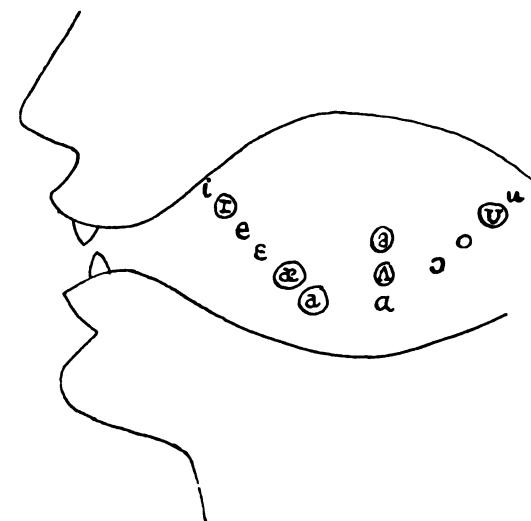


FIG. 3.

BLACKBOARD WORK.—Chart of the mouth with the script symbols of the vowels taught. The sounds new in this lesson might be surrounded by a circle, as in Fig. 3.

Sounds	Words	Sounds	Words
i	dean	ɔ...	shot
ɪ	bit	o...	rose
e	maid	ʊ...	foot
ε	red	u...	lagoon
æ	cat	ʌ...	but
a	town	ə...	sir
ə	path		

THE SELECTION OF LITERATURE FOR STUDY IN THE SECONDARY SCHOOL.

By WILLIAM BOYD, M.A., B.Sc.

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IN selecting books for literary study, the teacher has to take into consideration two points of view. On the one hand, the judgment of the adult world as to the books that everyone ought to know defines broadly the limits within which choice must be made. There is a certain agreement among students of literature about the works entitled to rank as the classics of our tongue, and it is expected, rightly enough, that the more important of these should be brought within the scholars' ken some time during the school course. On the other hand, there are certain interests, as well as limitations of interests, on the part of the pupils, which make some books more profitable for study than others. It is obvious that the teacher of literature can only get the best work out of his class by taking this fact into account. If the general order of sentiment and thought that prevails in a book is much above the level of the pupil's mind, there can be only one result: instead of bringing the boy or the girl up to the level of the literature, the study of it will, in all probability, help to make reading in general distasteful.

Even then, if we grant that the adult judgment is entitled to consideration in the selection of books for school study, we must make their power to appeal to the youthful mind the final test of their suitability. If a book is not "interesting"—meaning by that, that it is either already related or can be brought into relation to some interest of the pupils—it is of no educational value, and its study is worse than useless. It has been too long taken for granted that what interests grown-up people ought to interest boys and girls. But the youth seems now to have come to his kingdom, and there is a general recognition that his thoughts and his concerns are different from those of his elders. The obvious conclusion from this is that the reading imposed on him for purposes of study should be determined not by *a priori* views of what a man ought to know, but by reference to the needs of the growing mind.

Here the question at once arises: What are the special characteristics of the adolescent mind? What are the interests, either now present or shaping themselves, to make their appearance in the near future? The answer is by no means easy to get; but we are not left altogether without some notion of it. The child-study movement, though yet in its infancy, has some facts about the growth of mind to put at the disposal of the teacher. Meagre as these are, they are full of suggestion as to those interests of youth, on which with proper teaching the acquired taste for literature can be grafted. Further, the teacher, with a little child-study on his own account, can help himself to an answer by finding out the kind of books his pupils read when left to their own devices. It is going too far to say with one Ameri-

can writer, who has made a careful study of children's reading, that "when 95 per cent. of the boys prefer adventure, or 75 per cent. of the girls prefer love stories, that is what they are going to read." There are more ways of satisfying a mental want than one, and it is the teacher's business to find out the best way. But before he can do so, he must know what the want is. In this matter of reading, surely the spontaneous interests of the pupils give most valuable guidance which the teacher would be foolish to ignore.

Let us consider first the general course of adolescent growth. Here the central fact is puberty, the incidence of which about the age of fifteen initiates a grand transformation of body and mind. In school life, the change usually becomes evident about sixteen, and nowhere more markedly than in literary taste and appreciation. For our present purpose, therefore, we may consider the years immediately before and after sixteen as two distinct phases.

In the first phase, we note that concurrent with the rapid increase in height and weight, which is the most obvious indication of the adolescent process in the two or three years before puberty, there are not a few signs that the interests of the boy or girl are beginning to approximate to those of the adult. Reference will be made to this at some length when we come to speak of the personal reading of the boy or the girl at this age. For the teacher of literature, however, the outstanding fact is not this approximation to adult ways of thinking, but the change in mental tone that is shown in a quickened appreciation of rhythmic effects. It is this that underlies the new liking for music about twelve in girls and thirteen in boys, and that appears a year later in an increasing desire for the rhythmic movements of dancing and marching. Though in its early forms a somewhat crude phase of mind, like the fondness for bright colours and loud sounds that appears about the same age, it is, so to speak, the raw material of all literary taste; for the emotional rhythm implied in it is the basal experience out of which both prose and poetry have taken their rise. And whatever the *matter* of the literature put before the scholar at the period from twelve to fifteen or sixteen, care ought to be taken that in both prose and poetry there should be a well-marked rhythm. So far as my experience goes, the only literature that the thirteen-year-old can be got to like is of this kind. With proper teaching there is nothing to prevent a junior class coming to enjoy declamatory prose, or ballad and kindred poetry, such as that of Scott and Macaulay, or even good resounding blank verse like "Sohrab and Rustum." It should be added that the teacher's ability to bring out the feeling effects in his reading is an important factor in winning this appreciation.

There is a great increase in emotional intensity at puberty, but as the physical changes are followed by great mental changes, the new-born emotions spend themselves in the creation of new enthusiasms and interests, and the rhythm of feel-

ing becomes less important. This is the age when those aesthetic and ethical ideals from which originate all that is great and noble in literature become dominant elements in personal consciousness. Accordingly, if the great books of the past are to help the growing soul to bring its inchoate impulses into forms worthy of a rational being, they must be chosen with wisdom and discrimination, and taught at the proper season. The question is again one of right order. Which phase of the ideal comes first? It is not easy to generalise; probably there are considerable variations in individual cases. But, speaking broadly, the earliest to appear seems to be the feeling for nature. Now, if ever, flowers and clouds and mountains and stars are seen as things of beauty, and it only needs a worthy interpreter to make the whole world a house beautiful. Happy the teacher whose gifts and knowledge fit him for the task of making the poetry of nature live again in the souls of his pupils! About the same time, or it may be a little later, the new sex activities struggle out of body into mind, and become part of the spirit life. Forthwith, the romantic love, mystery of mysteries to the pubescent, becomes full of meaning and vast regions of poetry unfold their secrets. Again, literature rightly selected can anticipate and prepare for experience. The age of the first understanding of love is also the age of ethical quickening, which expresses itself sometimes in religious conversion, and more frequently in a new seriousness of purpose. This is a pre-condition for understanding our graver poets, our Miltons and our Wordsworths, themselves men of a high seriousness that had something of perpetual adolescence in it. Last of all, some two years later, when the youth is about eighteen, there takes place a great intellectual advance, in supplement of the earlier aesthetic and moral progress, that opens to him the greatest things in literature, the literature of philosophy and poetic sublimity. After that, experience may extend understanding, but there is nothing in our language which cannot be brought in some measure within the scope of the youth of generous heart and good capacity.

So far we have spoken about the adolescent development in general terms; but the teacher will be all the better if he can find out by personal inquiry the individual bent of mind of his pupils. There are certain broad interests common to all youths; there are others of a more local kind, due to the influence of home and district. The better the teacher knows both, the more satisfactory will be his prescription of reading. In the first place, it may be worth his while to make himself acquainted with the results of similar inquiries that have been made at various times, both in this country and in America;¹ he will then know what to look for. I have found two methods of use in an inquiry of this kind. The simplest and most illuminating was to get the older pupils to become autobiographical about their reading, past and

present. Girls in particular are often apt psychologists, and can disentangle with considerable success their likes and dislikes. This method is most successful with the best pupils. For this reason, it needs to be supplemented by finding out what the more ordinary boys and girls think about their reading when it is going on. This can be most easily done either by prescribing reading from a comprehensive list of books, as part of the class-work, or, better still, by managing a school library and keeping careful note of the books that go out most and least frequently. If his experience is like mine, the teacher will probably learn some unexpected facts about the likes and dislikes of boys and girls in the matter of reading.¹

Partly by way of illustration, partly because it has some bearing on what comes after, I may note briefly the results of such an inquiry made by myself. The reading interest of boys, I found, becomes keen for the first time at twelve or thirteen, and the books that then appeal are tales of adventure: the heroes in biography and fiction are the men who do things. This is the age of the penny dreadful, which, after all, is not a very bad form of reading in the eyes of one who sees in it only the natural reaction from the monotony of the actual, and who knows how to displace it by better reading of a like kind that takes away the reader to scenes of action at a romantic distance from his own experience. About fourteen, a new phase appears. The interest in the records of energetic life is still maintained, but the heroes are found nearer home than the Indian or the pirate. This is the age when the detective story begins to appeal to certain boys, and the school story which idealises even more familiar conditions becomes interesting.² About sixteen, the boy begins to broaden out in his likings, and, while still retaining his fondness for adventure stories, is ready to admit adult forms of reading to a place among his interests. The reading of girls is in striking contrast with that of boys at two or three points. At an age when their brothers are either not reading at all or are deep in pirate lore, the girls are busy with sentimental books, in which tales of love or piety are predominant. Happily the rising flood of the new life at puberty carries them back to a healthier point of view; and about fourteen or fifteen their reading often takes a new turn more in keeping with their years. Stories about schoolgirls which do not appeal earlier are now read—a clear indication that they are escaping from unreflecting absorption in themselves and are idealising their own kind of life. Some girls show the reaction from the excessive femininity of the earlier years by a fondness for boys' stories. But in a year or two there is a return to adult

¹ As an interesting example, I may mention the fact that, contrary to my own expectations and the general opinion of adults, I found a singular unanimity among my boy friends in a dislike for biography. I placed a tempting volume on the life of Nansen within easy sight on the shelves of a library to which some forty boys and girls had access: and throughout a whole year it was never taken out.

² The stories of R. M. Ballantyne are excellent for the boy of thirteen or fourteen; those of Mr. Henty are appreciated more a year or two later, when the boy becomes interested in boys as subjects of fiction.

¹ For example, there is an interesting summary of American investigations in Dr. Stanley Hall's "Adolescence," vol. ii., p. 475 seq.

interests, usually more complete than in the case of the boy, and the reading is for the most part adult in character.

Having reviewed the outstanding characteristics of the adolescent mind in so far as they concern the teacher of literature, we may now make an attempt to draw up a list of books for study in the secondary school on the lines of the previous discussion. Are there any general principles to guide us in our selection? I suggest as a guiding rule that most of the books to be studied should be chosen from the work of the romantic writers. It is not altogether a fanciful parallelism to see in the ages of romantic writing a national mood akin to that of the adolescent. Whether we consider the age of Elizabeth, with its breezy, adventurous life, or the more reflective period in which Wordsworth is the great figure, we find the restless intensity of spirit that marks adolescence; and the result is the same in both cases. There is the same weariness of ordinary ways, the same desire to hear of life removed from the present to a romantic distance in far-off lands or far back times; and when this restlessness is driven inward and provokes reflection, there is the same turning from the world of men to find nature sympathetic. If then it be granted that the selection of literature should be guided by the interests of the pupil, we may expect to find in the romantic writers abundant material for literary study.¹

For the purpose of drawing up a list of suitable books for study we may divide the secondary-school period into three stages: (1) From twelve to fourteen; (2) from fourteen to sixteen; and (3) from sixteen upward.

(1) PROSE.—R. L. Stevenson: "Treasure Island," "Kidnapped"; Conan Doyle: "The White Company," "Micah Clarke"; Addison: "The De Coverley Papers" and other selected essays; Malory: Selections.

POETRY.—Scott: "Lady of the Lake," "The Lay of the Last Minstrel" (long descriptions of scenery better omitted); Macaulay: "Lays," &c.; Goldsmith: "The Deserted Village"; Longfellow: "Evangeline"; Coleridge: "The Ancient Mariner"; Shakespeare: "Julius Caesar," "The Merchant of Venice."

(2) PROSE.—Scott: "Ivanhoe," "Rob Roy"; Dickens: "David Copperfield"; "English Essays" (World's Classics Series); Lamb: "Essays of Elia" (selected);¹ Macaulay (selections² rather than complete essays); Ruskin: "Sesame and Lilies" (for girls).

POETRY.—Byron: "Childe Harold's Pilgrimage"; Wordsworth: Selected Poems; Gray; Cowper; Milton: Shorter Poems; Tennyson: "Idylls of the King"; Shakespeare: "The Tempest," "As You Like it."

¹ It is possible that some may argue that just because the weaknesses of adolescence and of romanticism are the same, the more exact work of the classical writers ought to be read as a corrective. The question is really a fundamental one for the philosophy of education and too big to be discussed in a footnote. I think that there is enough truth in the criticism to make it worth while to introduce the classical writers in the last years of the school course after the taste for good reading has been established; but even then I would keep them subordinate to the romantic poets and novelists.

² The selections published by Arnold (2d.) are good. Almost all the selections of the same series are suitable for this stage.

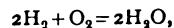
(3) For pupils over sixteen, the books studied ought to be grouped in periods. For example, a class might profitably go over the chief poets and prose-writers of the age of Wordsworth,¹ and attempt to view the romantic movement as a whole in doing so. Partly for purposes of comparison, partly because a school course without it would be incomplete, there ought to be added to the study list one of Shakespeare's great tragedies, preferably "Macbeth." Or, again, a good year's reading could be got out of Spenser, Shakespeare, Milton, and Bacon, with some Wordsworth or Tennyson to supplement it and represent a more modern phase of literature. Probably the teacher's own preferences ought to count for most at this stage; for only in so far as he can fill literature with personal feeling can he hope to succeed as a teacher of older pupils.

RECENT CONTRIBUTIONS TO THE STUDY OF CHEMICAL CHANGE.

By W. A. DAVIS, B.Sc. (Lond.),
Demonstrator in Chemistry, Central Technical College,
London.

III.—THE PROBLEMS OF COMBUSTION (continued).

In the last article (THE SCHOOL WORLD, March, 1907) it was shown that the burning of hydrogen involved much more than is expressed in the equation



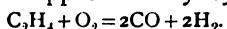
the nature of the change occurring being discussed at some length. In the present article the changes which take place when a hydrocarbon such as methane is burnt in an ordinary gas flame, or when alcohol is consumed in a spirit lamp, will be considered.

Faraday taught that in such cases of combustion the hydrogen exercises a greater attraction for oxygen than carbon, so that if air be present in insufficient quantity, some of the carbon will remain unburnt and appear as smoke. The fact that hydrogen is liberated when certain hydrocarbons are exploded with a quantity of oxygen insufficient for their complete combustion led Kersten, on the other hand, in 1861, to conclude that, before any portion of the hydrogen is burnt, all the carbon is oxidised to carbon monoxide, and that then the excess of oxygen divides itself between the carbon monoxide and hydrogen. This view gained support, thirty years afterwards, from the ingenious experiments of Smithells and Ingle on the structure of luminous flames, and from the results of Lean and Bone, who showed² that when ethylene is fired with its

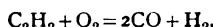
¹ See, Wordsworth, Coleridge, Byron, Shelley, Scott, and Lamb—following the reading list given in Wyatt's excellent "Tutorial History of English Literature," or using such selections as those given in the "Perry Poets," or Arnold's selections from the poets and prose-writers.

² In addition to the papers named in the last article the following may be referred to: Smithells and Ingle, Trans. Chem. Soc., 1892, 201, and 212; Lean and Bone, *ibid.*, 873; Bone and Cain, Trans., 1897, 26; Bone and Wheeler, Trans., 1902, 535; 1922, 1074; 1904, 603; Bone and Drury, Proc., 1904, 127; Trans., 1906, 660 and 1614; Bone and Stockings, Trans., 1904, 612; Bone and Smith, Trans., 1905, 910; Bone and Andrew, Trans., 1905, 1232; 1906, 652. Armstrong, Trans., 1903, 1028.

own volume of oxygen the *result* of the interaction can be expressed approximately by the equation



When, however, ethylene is exploded with less than its own volume of oxygen, although the change occurring is mainly that expressed by the equation given, the saturated hydrocarbon methane is also formed, together with some acetylene, a small quantity of solid carbon being deposited. In 1897 Bone and Cain showed that acetylene, on explosion with less than its own volume of oxygen, also gave carbon monoxide and hydrogen, in accordance with the equation



the excess of acetylene being resolved into its elements by the shock of the explosion, solid carbon again being formed. Whilst there was no doubt in these experiments as to the nature of the products formed in each case, it was extremely unlikely that the actual mechanism was as simple as that expressed in the equations

further oxidation (or hydroxylation) giving rise to



Methanediol
(=formaldehyde + water)



Methanetriol
(=formic acid + water)

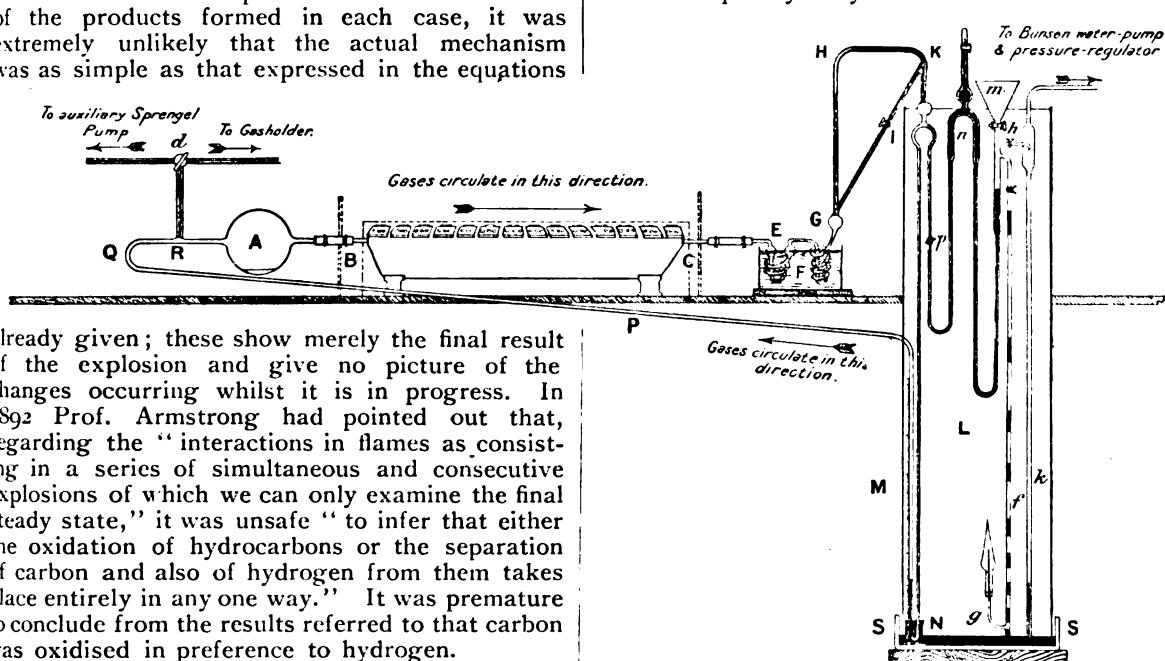


Methanetetrol
(=carbonic acid + water)

The first experiments were made by Bone and Wheeler by heating mixtures of methane and oxygen in glass bulbs during prolonged periods at temperatures between 300° and 400° C.; unlike the explosion of methane with oxygen which liberated hydrogen, this treatment gave rise to carbon monoxide and water, no hydrogen being formed. The results at first seemed to point to a simultaneous oxidation of carbon and hydrogen as expressed by the equation

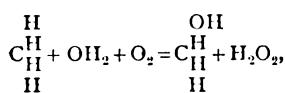


but subsequently very different results were ob-



already given; these show merely the final result of the explosion and give no picture of the changes occurring whilst it is in progress. In 1892 Prof. Armstrong had pointed out that, regarding the "interactions in flames as consisting in a series of simultaneous and consecutive explosions of which we can only examine the final steady state," it was unsafe "to infer that either the oxidation of hydrocarbons or the separation of carbon and also of hydrogen from them takes place entirely in any one way." It was premature to conclude from the results referred to that carbon was oxidised in preference to hydrogen.

Since 1897 a series of very striking researches on the incomplete combustion of hydrocarbons has been made by Prof. Bone in conjunction with others, the results of which show that, in combustion, oxygen is gradually introduced into the hydrocarbon molecule precisely in the same way as it is when wet oxidising agents are used, and that in principle there is practically no distinction between slow combustion and the high temperature explosive changes occurring in a flame. It is clear that the oxidation of a hydrocarbon such as methane occurs in a series of stages, each consisting of hydroxylation, brought about in the same manner as the oxidation of hydrogen itself, by the influence of oxygen and water conjointly, as explained in the second article of this series. Methane gives initially methyl alcohol, CH₃OH, thus :

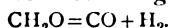


tained when an arrangement was devised by means of which the mixture of methane and oxygen could be circulated through a Jena glass combustion tube heated at about 450°, filled with fragments of ignited porous porcelain; any liquid products formed were condensed by suitable cooling apparatus and in this way were prevented to a considerable extent from undergoing further oxidation. The apparatus used is shown in the figure. The glass globe A served as a reservoir for the circulating gases: it contained a few c.c. of water, so that the gases circulating were always moist. BC is the glass tube heated in a furnace; F and G, glass worms cooled by water to condense liquid products; M, a mercury pump so arranged as to cause a constant circulation of the gases, the gas pumped off being returned at N to the system ABC by means of a glass connecting tube, P.

Samples of gas could be removed for analysis

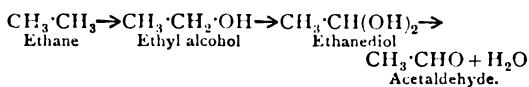
at any moment by means of an auxiliary Sprengel pump. By means of this arrangement it was possible to show that the water condensed in F and G contained a considerable quantity of formaldehyde, H·CHO; in one experiment 22 per cent. of the methane burnt was accounted for in this way, the formaldehyde being produced by the decomposition of methanediol originating in the manner explained above. A large proportion of the gaseous product consisted of carbon dioxide, comparatively little carbon monoxide being produced. There is little doubt that the carbon dioxide arose from the formation of methanetetrol, C(OH)₄, this substance being resolved into carbon dioxide and water. The formation of methyl alcohol, which was stated above to be the primary product of the oxidation of methane, could not be directly demonstrated owing to the fact that it undergoes oxidation under the conditions used more readily than methane itself; but subsequent experiments, which showed the possibility of oxidising ethane to ethyl alcohol, made its production at the commencement of the change a practical certainty.

The fact that formaldehyde is produced at an early stage in the slow oxidation of methane makes it possible to explain the formation of carbon monoxide and hydrogen when an equimolecular mixture of methane and oxygen is exploded. On being heated strongly formaldehyde is decomposed according to the equation

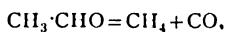


The liberation of hydrogen, which was formerly considered to show that oxygen combines with carbon in preference to hydrogen, is, in reality, merely the result of the thermal decomposition of one of the primary products of the oxidation. The actual behaviour of formaldehyde, on being heated, was found by Bone and Smith entirely to confirm this view.

Leaving the combustion of the simple hydrocarbon methane, we are in a position to consider that of the next member of the series of paraffins—namely, ethane. Here matters are somewhat more complicated, but—and the remark holds true of other hydrocarbons, such as ethylene and acetylene—the general principle of oxidation which has already been stated—that oxidation is primarily hydroxylation—enables the general course of the action to be followed.



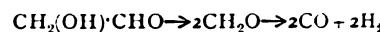
Ethyl alcohol is the primary product, but being more susceptible to oxidation than ethane itself it is rapidly converted into ethanediol, which is resolved into acetaldehyde and water. As combustion proceeds, part of the acetaldehyde is decomposed by heat into methane and carbon monoxide,



whilst the remainder is further oxidised to form probably glycollic aldehyde,



which then breaks down into formaldehyde, or its decomposition products carbon monoxide and hydrogen :

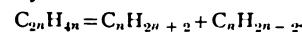


Some of the formaldehyde undergoes further oxidation, giving ultimately carbon dioxide. It is seen that at an early stage the ethane is resolved into methane or derivatives of methane, the slow combustion of which has already been dealt with. The foregoing series of changes is also applicable to explain the processes first occurring in the flame of a spirit lamp burning ordinary alcohol : in this case, as in that of ethane the parent hydrocarbon, a complex product is obtained, consisting of carbon dioxide, carbon monoxide, methane, hydrogen, acetaldehyde, formaldehyde and steam, in proportions which differ widely according to the conditions.

The behaviour on combustion of hydrocarbons more complex than ethane—whether of the paraffin or other series—is doubtless similar to that of ethane, but purely thermal changes never play a more important part. When combustion is once started the more complex hydrocarbons are resolved by heat into simple hydrocarbon molecules prior to oxidation. Paraffins are first resolved into a paraffin containing half the number of carbon atoms present in the original hydrocarbon, thus :

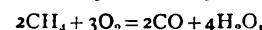


and olefines into a lower paraffin and the corresponding acetylene :



Carbon is the final result in such processes when pushed to the extreme. A similar series of disruptive changes probably takes place during the burning of other organic substances such as the fats and waxes, and we are thus brought back to the point from which we started—Faraday's conception of the changes occurring in a candle flame.

The most striking fact established in the researches briefly summarised above is the comparative simplicity of the actual processes occurring during combustion ; the results appear complicated because several changes occur side by side or successively with extreme rapidity, but each change in itself is of a simple character. Thus it has been shown that the oxidation of methane at 300–400° instead of being a quinque-molecular process expressed by the equation



and necessitating the simultaneous coalescence of five different molecules, is in reality a change occurring in stages, each of which involves a system of two or three molecules only. The extraordinary rapidity with which the successive changes occur, as demonstrated by the study of the phenomena of explosion waves, is perhaps the most surprising feature in connection with these phenomena ; but in the present place it is impossible to do more than make a passing allusion to this side of the question.

TEACHERS' PENSIONS.¹

By FRED CHARLES, B.A.
Strand School, London.

III.

WHILE the larger schools find difficulty in providing money for pensions or retirement allowances, the smaller schools, while unaided, cannot be expected to do anything. The great difficulty is, of course, want of money; other obstacles, which are certainly not insuperable, are the movement of men from school to school, often from one district to another, and their constant disappearance from the profession. A master leaving a school, the governing body of which has been paying one-half of his insurance premium, would, if presented with the policy, have great difficulty in paying the increased premiums, and to surrender the policy would mean considerable loss of very hard-earned savings.

In 1904 a special sub-committee of the Joint Conference of the Incorporated Associations of Headmasters and Assistant-masters drew up a report, which was afterwards adopted by the conference and by both associations. The committee carefully considered a number of schemes in respect of both principles and details. The scheme of the Welsh Central Board commends itself, not only because it applies to the whole of Wales and is administered by a central authority, but also because of the manner in which contributions to the fund are regulated and graduated.² A similar plan for the whole of England would, in the opinion of your committee, best meet the needs and requirements of secondary teachers in this country; and, indeed, a scheme on these or similar lines must ultimately be adopted as the only satisfactory solution of a very difficult problem. It does not appear probable, for divers reasons, that such adoption is likely to take place at present, or in the near future. In the meantime, however, local education authorities (both county councils and borough councils) should be urged to establish schemes of a somewhat similar character. . . . The committee believes that the best course at present would be for each authority to devise its own plan in view of the special needs of the district. Where, however, this is not done, the committee is prepared to recommend the adoption of such proposals as are now being made by high-class insurance companies. . . .

Finally, the committee desires to put forward as essentials of any scheme which is adopted:

(a) Graduated contributions by masters.

(b) Contributions of at least equal amount by governing bodies or local authorities.

¹ The second article appeared in THE SCHOOL WORLD for August, 1907.

² Contributions of Teachers.—The contributions of teachers shall be according to the following scale

Salaries greater than £100,	£200,	£300,	£400,	£500,	
but not greater than £100,	£200,	£300,	£400,	£500.	
Age	Per cent.	Per cent.	Per cent.	Per cent.	
Under 30 ...	2½	2½	3	3½	4
30 to 39 ...	2½	3	3½	4	4½
40 to 49 ...	3	3½	4	4½	5
50 and over ...	3½	4	4½	5	5½

In reading this scale the age must be understood to be the age at the date of the first contribution to the pension fund; the salary, however, is the actual salary at the date of each successive contribution.

Contributions of Governing Bodies.—The contributions of the county governing bodies shall be on a scale 60 per cent. higher than the scale for teachers.

(c) A retiring age of sixty, with an option to an assistant-master of retiring on reaching the age of fifty-five and upwards up to sixty, and an option to the headmaster (with the permission of the governing body) to defer the retirement of the assistant-master to any age not exceeding sixty-five.

NOTE.—The age of sixty is, in the opinion of the committee, the most fitting age for retirement, but in many cases it may be necessary to fix a later limit in order to prevent the scheme becoming too burdensome to the parties involved.

(d) In the event of a teacher retiring before the limiting age, his contributions should in all cases be returned to him, and where his services have extended over several years, there should be in addition a reasonable rate of interest and some small share, depending upon the length of his service, in the profits or bonuses.

(e) In the case of a "bad life," the risk should be shared between the master and the other contributory or contributories (not being masters) to the fund. (This might be done on the principle of a sinking-fund policy, or in some other similar way.)

These paragraphs are cited at length because the report has the sanction of the two bodies mainly concerned and best able to gauge the effect of offering pensions to both head- and assistant-masters.

Other suggestions have been put forward by individuals, and have received more or less support. But few have been tried owing to lack of money. The same serious want has prevented any advantage being taken of the permissive clauses inserted in the schemes of many schools for girls. Of these I have not sufficient knowledge to offer any summary of the arrangements for pensions and retiring allowances. I know only of arrangements of easy terms granted by insurance companies.

To return to the other suggestions, some of which seem worthy of serious consideration. The pensions should be attached to the masterships; if the scheme is worked by an outside company, that is, by a company other than the school governors, the premium should be paid, partly by the governing body of the school and partly by the incumbent by deduction from salary; it would be better that the salary quoted be net, after allowance has been made for the insurance premium.

The amount of the pension should depend on the salary, say three-quarters of the last salary. In the same way with the junior masterships; the salary being less, the retiring allowance would be less, and consequently there would still be the same desire for promotion. So with heads of departments and well-defined masterships, in which slight rearrangement of work or staff would make no difference. The ordinary masterships could well be arranged on exactly similar lines by means of a salary scale like those now being adopted by the county councils and other governing bodies.

Another suggestion which overcomes the difficulty of want of uniformity and diminishes the money difficulty, together with a modification of it, is the last that will be noticed. A uniform

scheme should be applied to all schools connected with the Board of Education. The most original feature of this scheme is that the assistant-master, the governing body of the school, and the Board of Education should pay equal shares of the premium; the scheme should be managed by the Board; an assistant-master leaving a school before he has earned a pension should receive his own contributions with interest, while the other contributions revert to the fund. The pension should depend on length of service and on salary.

As uniformity within certain limits is necessary, no scheme which has not the sanction and aid of the central authority can hope to succeed. Without the aid of public money no scheme can be worked effectively, and the one and only power capable of inaugurating a satisfactory pension scheme is therefore the Government.

THE EQUIPMENT OF GEOGRAPHICAL LABORATORIES.¹

By A. E. L. HUDSON, B.A. (Oxon.),
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II.

IT will perhaps not always be possible for all the geographical work of a large school to be done in the laboratory; and that part which can be transferred with the least inconvenience to ordinary class-rooms will be the most elementary part. To this end boxes of apparatus may be arranged, each of which will serve to illustrate the teaching of some definite topic. Boxes about 18 by 15 by 9 inches—very nearly the size of the boxes in which condensed milk tins are packed, which boxes may, indeed, be used, *faute de mieux*—may be fitted with projecting handles and with a strip of wood under each end. The handles enable the boxes to be carried about from room to room, and the strips underneath are of such a length and so placed as to fit closely into the mouth of a similar box below. The boxes form a neat pile, and a lid for the top one keeps out dust. Such boxes might contain :

(1) Models made with rubber balls, knitting needles, corks, and black, white, and red paint, and fixed on black wooden bases, to illustrate the circles of the sphere.

(2) A similar set arranged to show day and night, with a sheet metal or card attachment, or preferably a separate model, to show the relation between the hour of the day and the position of the sun.

(3) A set for the seasons, with inclined axis.

(4) Set of globes, such as Philips' 1s. 6d. Graphic globes, variously split, graduated and mounted, to follow up the same subjects.

(5) Sets to illustrate the phases of the moon and the tides.

Each of the above sets should be supplied with a dull black screen for use as a background, and with a suitably shaded burner for connection to the gas supply of the room in which it is to be used.

All mounts and non-significant parts should be painted black.

Series of specimens illustrative of some process or classification—e.g. :

(6) The water-cycle and its work. The series—detached block, weathered block, boulder, pebble, sea-sand, mud, sea-salt, chalk. Models of river-valleys and sea-deposits in illustration.

(7) Rock specimens to show the more obvious characteristics of sedimentary and igneous rocks.

(8) Sets of small specimens of minerals and rocks for observation, description, and comparison by individual pupils.

For more advanced work the "series-boxes" of the museum will be suitable.

The shelf mentioned in the first of these articles as being fixed outside a window facing nearly S. is intended to hold a fixed globe, a direction-table, like those placed at view-points in Continental tourist resorts, a quadrant for observing the meridian altitude of the sun, and a simple gnomon.

The fixed globe has its axis parallel with that of the earth, and the radius running to the place of observation set in the vertical; it is therefore always similarly situated, with regard to the sun, to the real earth, and by consequence similarly illuminated; in order to have the boundaries of the illumination fairly visible it is found necessary that the shelf, &c., be painted a dull black, to prevent excessive reflection on to the shaded parts. This globe differs from that described by Prof. Gregory in the August issue of THE SCHOOL WORLD in being permanently fixed and in possessing neither means of adjustment for latitude nor movable meridian: the former is not necessary for a fixed globe; the latter it is proposed to add, but in such a form as to be not only movable but removable, the idea being to present the natural conditions as simply as possible. The difficulty of protection from the weather is overcome by placing the globe under the kind of glass shade which is used to protect wax flowers.

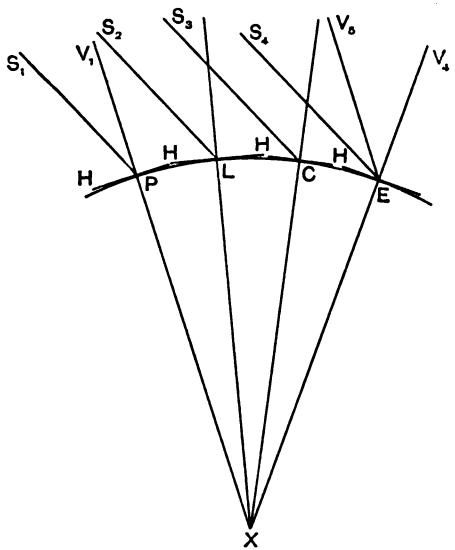
The gnomon is 10 cm. high, and stands on a slate surface; measurements of the shadow taken from its foot are made by members of the class, and given to the whole class to record and plot.

The true and magnetic meridians are marked by red and black arrows respectively on opposite walls of the school buildings; they intersect over a mark to which the plumb-line of the theodolite is set. The finding of the exact latitude and longitude of this mark forms a very good exercise in accuracy for seniors, latitude being obtained by the use of the artificial horizon, and longitude by transferring Greenwich time by stop-watch from the nearest time-signal. Another method is by survey and measurement on the Ordnance Map. The latest edition of the 25-inch map does not contain the new playground, several new buildings belonging to the school, or any of the new roads or houses in its immediate neighbourhood: these will therefore be drawn in from actual survey and measurements.

An attempt was made to arrange a series of simultaneous observations of the sun's altitude

¹ The first article appeared in THE SCHOOL WORLD for August, 1907.

at noon during the month of June, 1907, by schools on the same meridian. The attempt failed for two reasons: a beginning was made with Scottish schools on the meridian of Pontypridd, but the time of year proved inconvenient; in the second place, the exceptional weather of this summer made it impossible to get a single noon observation in Pontypridd during the month; next year it is hoped to arrange with schools in Edinburgh, Carlisle, Liverpool, and perhaps other towns. The reasoning to be applied to these observations is by no means beyond the powers of an intelligent boy or girl of fourteen; in order that the classes may, after observing the altitudes and communicating their figures for the month, proceed to prove the roundness of the earth and to measure its size roughly, the only mathematical principles required are the facts that the circumference of a circle subtends at its centre an angle of 360° , and that parallel straight lines make equal angles with a third straight line which they meet.



If P, L, C, E be points on a meridian of the earth, in order from south to north, and PS_1, LS_2, CS_3, ES_4 lines running from them to the sun, and therefore parallel, few boys will fail to understand that, H being the south point of each horizon, if the sun's altitude differs at the different places, i.e., if the angles $HPS_1, HLS_2, HCS_3, HES_4$ differ, the horizons cannot be parallel; further, that if they make angles increasing or decreasing regularly in one direction, the local horizons must fall away regularly from the end one of the series.

Again, if the altitude of the sun at $P = S_1 PH$, and at $E = S_4 EH$, then the respective zenith distances are $S_1 PV_1$ and $S_4 EV_4$. But by drawing EV_5 parallel to PV_1 it is easy to show that the difference of zenith distances (or of altitudes) = $V_5 EV_4 = PXE$; i.e., is equal to the angular distance apart of the two places at the earth's centre.

Suppose this to be a° , then its arc is $\frac{a}{360}$ of the

earth's circumference, but the actual distance, as measured by the class on maps (Bartholomew's $\frac{1}{2}$ -inch for preference), is so many miles; hence calculate the length of the circumference.

Given a month of ordinary June weather, it will surely be that when the results of the observations are exchanged at the end, some days will be found on which there has been clear sky all along the line; and the members of the classes may have the pleasure of making the whole of the observations and calculations for themselves with the one exception of the measurement of the distance between the places of observation, which they take from other people's survey.

These observations will show the roundness of the earth in the meridional direction; to show it in longitude is not so easy; perhaps the most striking illustration is to arrange for a telegram to be sent from India or Australia, if one has friends in any suitable place, in such a way that it apparently arrives before the time of its despatch. The discussion of this circumstance and the attempts to puzzle out its cause will lead up to the fact that times and meridians follow one on the other round the globe.

The fact that the earth is not merely a globe, but a rotating globe, is most easily demonstrated by sight during a lesson of at least an hour's duration on a clear night; for the imagination, if carefully directed, finds little difficulty in picturing the real motion, at a time when moving points are visible over the *whole* sky; with the sun alone, it is more difficult. A bare hill-top with a wide clear view is the ideal place for this lesson. A model of the axis and equatorial plane and nothing else, placed so as to be illuminated by the sun during the day, and in a position to be compared with the starry sky at night, will be found useful; the axis should be tubular and directed to the Pole, and the whole should be mounted on a post about five feet high. It is to be hoped that instrument makers will soon provide us with a light and fairly accurate model of a theodolite for school use, so made that it can be inclined for use as an equatorial telescope. A real theodolite is, of course, very valuable for meridian observations.

The rotation may, however, well be shown experimentally in the laboratory in a lesson of the ordinary length by means of Foucault's pendulum or the gyroscope, the plane of the pendulum's swing or the axis of the gyroscope being arranged so as to include the sun or the moon. The pendulum will, of course, move equally only at the pole of the earth, but for this purpose the mere fact of the earth's moving under it is sufficient.

It is perhaps too much to expect that such phenomena as the aurora shall be illustrated by vacuum tubes excited by coils and batteries specially belonging to the geographical laboratory, or that the condensation of alcohol vapour under rapidly reduced pressure which is visible in a quickly exhausted bell-jar should call for the provision of an air-pump for the purpose, but these are experiments that may come late or not at all in a modern school science course, and it

should be possible to borrow the apparatus required for them from the physical laboratory.

The relief models now on the market suffer in many cases from the adoption of a vertical scale differing greatly (and often irregularly) from the horizontal one, and from the consequent representation of, say, a hill like Snowdon as a kind of slender stalagmite, utterly unlike its real form. Models with this defect of exaggeration of vertical scale are certainly of use in elementary teaching, but their usefulness vanishes when they are examined in detail. Models of comparatively large regions must be simplified so as to become almost diagrammatic, if useful relations of scale are to be preserved.

More useful will be a model of the school district or some neighbouring one showing fair reliefs, made on equal vertical and horizontal scales. This may be constructed in many ways, but the following one gives good results. Three-ply drawing boards (about $\frac{1}{8}$ inch thick) are taken, and each board is allowed to represent a height of 100 or 200 feet. The vertical scale being thus determined, the horizontal scale is calculated, and a contour drawing taken from the 1-inch or the 6-inch Ordnance Map is enlarged or reduced to the scale, as the case may be. Grapp'd copies of the drawing are made, at least to the number of the altitude-bands to be represented, and on each copy one band—say those between 0—100 feet, 100—200 feet, &c.—is shaded to indicate which slope is to be expressed by the edges of each board. Each sheet of paper is cut out round the outer edge of this contour-band, and is pasted on a board as a pattern, and the board is cut out round the lower contour with a fret saw. Then the shaded band, which is at the edge of the shaped board, is pared away with gouge, chisel, and spokeshave to give the slope between the two contours. The board now has a large lower surface, bounded by the larger contour, and a smaller upper surface, bounded by the smaller and higher contour, and edges that fall away all round from the higher to the lower. When all the boards have been treated in the same way, the whole model will, on being built up, give an orographical representation of the region included. The paring away of the slopes should be done with constant reference to the map, and care should be taken to render sub-features and valley-forms correctly. Vertical pegs rising from the base-board, but not piercing through the upper layers, will keep the parts of the model in place. They should have their position (under the highest points of the hills) exactly shown on the grapp'd drawing, and will then be rightly placed at all levels. The boards may now be painted to correspond with the scale of colour for altitude adopted in the atlas used in the school. This will probably be done in shades of green, buff, and brown, or some of these; water may be added in blue, railways and political boundaries in red, towns, &c. (with or without names), in black, and roads in dark brown. If it is desired, a vertical section may be made through the whole model, having

the layers coloured for altitude, with the addition of white verticals from the base-line to the point where each contour reaches the surface.

If a difficulty is found in carving the edges of the board into slopes, a fixed model may be made by filling up the steps with plasticine, or sand wetted with gum-water, and then making copies in plaster of Paris. Plasticine of various colours may be used alone, especially for geological models, being rolled into layers, either equally thick all through or thinning out at the edges, with a pastry-cook's rolling-pin. A sharp knife should be used for section-making, and the effect of keeping the modelling tools wet with water, oil, or spirit should be tried, according to whether the material is to be plastered down smoothly like putty or sharply carved. Very beautiful models of geological features in coloured woods are to be obtained, but these are expensive, and have the disadvantage of not having been made by or in the presence of the pupils.

At least one coloured contoured model should be capable of being completely submerged in water. The best arrangement is a tank with a pipe at or near the bottom of one side, so that it can be quietly and exactly filled to any desired level by connecting it with the bench water supply by means of a rubber tube. One model should also be treated as a "solid geometry" object, and have its projections painted on a triple blackboard, under, behind, and at one side of it.

For relief or geological models of larger regions, such as the Weald, the S. Wales coal-field, or the Pennines, a somewhat similar plan may be adopted, using thick paper as the material. Orographical models may be built up of layers of the "Nature" mounting papers used by photographers; naturally such maps will need much simplification, but all essential features can be shown. When the layers are pasted together and dried—preferably on a glass base with blue paper below—outstanding peaks, towns, boundaries, railways, &c., can be painted on. Such models, while only giving the location and general shape of mountain masses and plains, will at least be free from grotesque exaggeration, and will certainly not be less realistic than the contoured maps to which the pupils are accustomed, and which the models will serve to explain.

Geological maps on the same plan may be made very useful for purposes of explanation, but their component parts will require some care in the cutting out and fitting together. Where a formation is lost to sight by passing under another formation, it is only to be shown as going under it for a short distance. This will serve both to keep the thickness of the model right, and to emphasise the fact that we know but little of what lies at even a short distance below the surface, and can only infer the presence and position of buried strata from their dip and their succession at the surface.

In the case of a model of the Weald, the Weald Clay will be represented by a horseshoe-

shaped piece of paper, in the centre of which appears a lower piece to stand for the Hastings Sands; this lower piece passes only a little way under the former, and has a small piece under the middle of it to represent the uplift which forms the Forest Range. The Weald Clay again passes a little way under the scarp-edge of the Greensands, and they under the Chalk, each horseshoe having an opening a little wider than the inner and lower one next to it. In some such manner the succession and relation of the formations may be represented, without conveying any ludicrously false ideas.

OXFORD LOCAL EXAMINATIONS, 1907.

HINTS FOR TEACHERS FROM THE EXAMINERS' REPORTS.

PRELIMINARY.—The examiners in *Arithmetic* report that decimals again proved a serious stumbling-block to many. Among the later questions, comparatively few candidates understood the measurement of areas. Half an hour's practical measurement with a foot rule of the floor, carpet, walls, &c., in a room, would have made quite simple what proved to be far the most difficult question in the paper.

The candidates answering the questions on *St. Matthew* did not, as a rule, confine their answers to events recorded by St. Matthew. The spelling of proper names, too, was often weak.

In the answers to the questions on *English History*, period A (1066–1399), the weakest point was the geography; in those on period B (1399–1603), the examiner says that dates should be more accurate, and also titles of kings: e.g., Edward VI. for Edward IV., and Henry IV. for Henry VI., were common mistakes.

In the case of period D (1714–1815) there was an almost universal tendency to answer the more general questions by giving bare tables of names of places or events without connection or explanation, sometimes even without any attention to chronological order. In many cases the history had evidently been learned without much use of an atlas.

Many candidates taking *Geography* lost marks by misreading questions, or wasted time by answering questions which were alternative to each other. Some of the answers, wholly or partly irrelevant, appeared to have been written down from memory. The maps as a rule were correct but untidy.

The main fault in *French* was that candidates who knew the subjects of their prepared books guessed at a possible sense for the French words. The answers to purely grammatical questions, while often displaying a real appreciation of the point to be explained, were in the main less satisfactory.

The most noticeable point in *Algebra* was that very few indeed of the candidates, judging from their papers, understood how to prove an identity:

many of those who attempted the question at all treated it as merely an equation to be solved, and naturally failed.

Many cases of failure in *Geometry* were due to the question not being carefully read, with the result that some proposition not asked for was proved. In many cases the figures were well drawn, but sometimes the pencils used were so soft that the lines ran together and were not clear.

The knowledge displayed in the *Botany* answers to the questions on plant physiology was not so great as might be wished. There was a disinclination in the elementary *Heat* papers to give *reasons* for the statements made and to draw logical conclusions from the observations quoted.

JUNIOR.—Reporting on the *Arithmetic* papers, the examiners point out that in the addition of mixed fractions the working was frequently complicated by reduction to improper fractions and by the use of the product of the denominators, instead of the L.C.M., as the common denominator. In the use of the unitary method in questions involving compound proportion much advantage was often lost by not delaying the multiplying out of the factors to the last moment. The answers to a question requiring the length of the side of a square field containing $2\frac{1}{10}$ acres revealed considerable confusion between the units of length and area. The phrase "lineal acre" occurred frequently. The necessity of clearly pointing the distinction between capital and income was illustrated by a question on Consols and income tax, a very large proportion of those attempting the question being of the opinion that a person pays income tax on the face value of his holding in a stock.

The examiner in *English History* (1066–1399) urges that students must be taught to write answers in their own words. As before, much energy has been wasted in efforts to reproduce from memory note-book summaries. There is also general inability to deal properly with questions on the policy or character of the monarchs of the period; the tendency in these cases being to give a list of events in the reign.

Of the papers submitted in *English History* (1603–1714) it is stated that the central features of the period, the character of the religious struggle, the real points at issue between the Stuarts and their Parliaments, the position of England with regard to the rest of Europe in the seventeenth century, were not sufficiently insisted on; but small points of detail, generally differing at different centres, had evidently been "got up" with great care. For example, pupils who were inclined to confuse James II. and Charles II. knew the date and the provisions of the Navigation Acts. It is essential, if history is to be taught with advantage, that it should be taught, even to young pupils, with a greater sense of proportion.

Of the work in *Composition* the report says: The paraphrasing is far from satisfactory. Though a certain number of the candidates have done it

creditably, the majority have in the main failed to understand the meaning of the passage set.

The weakest point in the paper on one of Stevenson's books was the attempt to describe the personal qualities of leading characters in the book. This usually resulted in a series of disjointed statements. There were a great many mistakes in spelling, even of names which were printed in the question paper.

The papers on *Shakespeare (As You Like it)* as a whole showed a great deal of knowledge, though it was often "ill-inhabited." The purely narrative questions were well answered, but the candidates did not sufficiently distinguish between narration and description. They also need closer instruction as to what is meant by context and explanation, and more attention should be given to the elements of metre. There was a welcome absence of padding, the answers being usually concise and expressed in simple, direct language.

Throughout the "A" paper in *Geography* the candidates exhibited a want of exactness and great incapacity to apply the knowledge they possessed. The questions did not appear to have been read at all carefully; much excellent but utterly irrelevant matter was frequently introduced. The maps on the whole were very badly done, and the sketch-maps illustrating the answers were poor. The knowledge of physical geography and its terminology were both very defective.

The inability of many of the candidates to locate important places on the map indicated, the report states, the need of teachers insisting more on pupils pointing out places during class lessons. There is also abundant evidence of the lack of sufficient training and practice in map drawing from memory.

The knowledge of *French* accidence was on the whole creditable, with one notable exception; the question on verbs being badly done throughout, that on the imperative especially so. The sentences revealed a great weakness in elementary syntax. Far too little attention seemed to have been paid to the order of words. The majority of candidates took the "unseen" passages. Their translation was in a few instances very good, but most of them found difficulty in rendering the few really idiomatic impressions that occurred. The passages from the set books were well translated, but the candidates as a rule showed little knowledge of the subject-matter.

Very few candidates taking *Algebra* really understood how to prove an equality between two algebraic expressions. The common method was to begin by assuming the identity, and to arrive at the result that $o=o$. The transformation of one expression into the other was rarely effected. In working the problem set, practically no candidate explained his statement, with the consequence that in very many cases marks were lost though the correct result was given, because it was quite impossible to see how the statement was arrived at.

There was much looseness of language in the *Geometry* answers, as exemplified by speaking of

the point of intersection of two straight lines as the point in which they "touch." Other instances are—a circle "touching" the points through which it passes, "producing" a point, and "the bisector" of a line (when the perpendicular bisector was intended). There was more carelessness than usual shown in misreading questions—e.g., proving Euclid I. 26 when I. 6 was required.

Judging from the answers in *Mensuration*, the examiner remarks that the successful use of logarithms does not seem to have been acquired; and it is rarely understood that it is desirable that the logarithms employed in a calculation should be written in vertical columns and always have the same number of decimal places. It was noticeable that several candidates at certain centres assumed the radius of a circle to be exactly one-sixth of its circumference. In ordinary arithmetical work it is important that greater attention should be paid to the position of the decimal point, and that the operation of cancelling should be performed with greater judgment and neatness. It should be realised that contracted methods, rightly performed, are consistent with a proper degree of approximation. Those candidates who used such methods frequently failed to observe the requisite conditions.

There were many untidy papers in *Elementary Experimental Science*, with the records of weighings and observations crowded together, no complete working out of the result being given. Further, it is to be remembered that the work has to be judged simply from what is put down on the paper, and, up to certain limits, the fuller this journal of work done is kept the better may its character be estimated.

There were great differences in the quality of work submitted in *Practical Chemistry*. The written accounts of work done and results attained were very unsatisfactory. It was very difficult to decide about the merit of work when the written account of it was carelessly done. In some cases experiments were described and conclusions omitted, while others gave the bare conclusions without the experiments which led to the conclusions.

The most noticeable defects in *Heat* were :

(a) Want of knowledge of elementary matters, such as the difference between "heat" and "temperature."

(b) A loose use of such terms as "heavy" and "light," with reference to density.

(c) Insufficient attention to quite elementary laboratory experiments; candidates have often been shown experiments of a most refined accuracy needing complex apparatus.

SENIOR.—In working the simpler questions in *Arithmetic* many candidates displayed a want of knowledge of decimals. This was especially apparent in a case of reduction of metres to feet. A large number also were ignorant of such elementary facts as the number of yards in a mile or of centimetres in a metre. The request that the answer should be expressed in a particular way was frequently ignored. The majority of

candidates seemed unable to carry out a process of reasoning accurately through several steps. Many of them, after beginning correctly, made a false step before the end.

Commenting on the papers in *English History* (1603-1714), the examiners remark that there was in too many cases a tendency to discursiveness, which resulted in candidates spending much time needlessly on one question; in some cases, too, candidates seemed to suppose that a great quantity of written matter was the object to be attained. In some of the more general questions this was specially noticeable, candidates making generalisations without instancing any facts upon which the generalisations were based. Again, there were whole sets of papers in which candidates seemed to think that a catch phrase was sufficient answer to a question. On the whole it is clear from the answers that the results depend enormously upon the stimulating power of the teacher.

In *English Composition* the essay was on the whole satisfactorily free from blunders of grammar and spelling, though not many of the candidates understood the use of any stops other than the comma and full stop. There were a good many compositions which were childish for a Senior essay, but, on the other hand, a few of the exercises were extremely good, and several displayed considerable knowledge. The exercises were decidedly less discursive than in past years. The paraphrase, on the other hand, was in the great majority of cases a conspicuous failure. The candidates rarely grasped the argument of the passage to be paraphrased before beginning to write, with the result that in many cases the paraphrase was sheer nonsense, and syntax was totally disregarded.

In *English Grammar* rash guesses and vague statements were common, especially in the "critical and grammatical notes" offered on certain passages. In very many cases the spelling and composition were extremely poor, and no attention had been paid to punctuation.

Candidates as a rule were deficient in knowledge of the text of *Shakespeare* (*Twelfth Night*). In consequence, only a minority of candidates could quote as they ought to have done passages and sayings from the play. Contexts were not well known. Many candidates treated the larger questions such as Shakespeare's skill in construction quite vaguely with no or insufficient illustrations from or references to the play. Apparently there has been too much getting up of introductions to texts, of books about Shakespeare, and not enough reading with enjoyment the work of Shakespeare himself. Perhaps because of this the description of character was not very well done. Allusions in the text were well understood, but many answers were evidently reproduced from notes learned by heart. On the other hand, there were many candidates whose work reached a high standard.

There was an entire failure to answer the context question on *Shakespeare* (*Coriolanus*), and the answers to the other questions betrayed the

same weakness—a lack of knowledge of the text of the play. Questions about the play were fairly well answered, but they rarely gave evidence of the first-hand acquaintance with the text which alone can give them any value.

The general level of the work in *Literature* was very low. The knowledge possessed by many of the candidates consisted of meagre collections of facts, in the selection of which no power of proportion was displayed. Candidates frequently revealed their ignorance of the authors about whom they were writing; and a first-hand acquaintance with the works of writers would have prevented many blunders. In questions which demanded a generalisation on the whole period, candidates rarely attempted anything more than a mere catalogue of names and dates.

In the piece set for translation into *French*, there were many mistakes, both from insufficient vocabulary and from a confusion between French and English constructions. In the answers to the grammar questions the weakness lay principally in the examples given by the candidates, which were often written regardless of concord and other requirements of syntax. The weakest part of the advanced paper was the free composition, which was taken by four candidates out of every five, and only too frequently resolved itself into a mere repetition of very few words strung together without regard for either style or grammar.

Arithmetical blunders, particularly in clearing expressions of fractions, were frequent in the *Algebra* answers. Factorisation, when applied to finding the H.C.F. of two expressions, was often done incorrectly. Many mistakes might be avoided by candidates knowing how to test their results. The use of the formula for solving quadratic equations was responsible for many errors; many candidates applied it unsuccessfully to the solution of a quadratic of which one root was zero. Very few candidates were able to prove the formula, generally stating it without proof; as was also done with the formula for the sum of an arithmetic progression. The work in permutations and combinations showed some improvement on that of last year, but was very far from satisfactory. There is still an obvious need for more common sense and fewer formulæ.

In *Practical Chemistry*, by far the greater number of candidates who attempted the analysis found elements which were not present in the substance supplied. Many of the mistakes were due to ignorance of the nature of the reaction on which the analysis is based, and many to carelessness, when the method employed was correct.

Some very good work was sent up in *Sound, Light, and Heat*, and candidates in most cases showed a good practical acquaintance with the subject-matter. At this stage one naturally expects a correct statement of the law of refraction, but fully fifty per cent. of the candidates failed to answer correctly the question on this subject. The fact that quantitative results are to be deduced from these laws should be emphasised.

ANCIENT ROMAN LEGENDS.¹

IT is always unpleasant to be made sceptical as to old stories, but often this has to be done.

As regards the legends of early Rome, since Niebuhr few or none have believed in them literally, although the last few years have brought a reaction, and it seems to be recognised that some truth must lie under the legends; but the excavation of the Forum by Boni, with its startling discoveries, has revived the question. M. Pais's second chapter (which follows on a discussion of the historical method) deals with these, particularly the Black Stone and the ancient inscribed cippus. By a comparison of the letters of this inscription with other inscriptions found on Italian soil, and a consideration of the stratum on which it stands, M. Pais concludes that it need not be earlier than B.C. 387, the year of the Gallic Fire, and that it may be referred with equal probability to the sixth, the fifth, or the fourth century B.C.² This is bad enough for the man of faith, but worse is to follow. The Cloaca Maxima is now "demonstrated" to be a work of the republican period, and the cemetery found by Boni, and assigned to a pre-Roman age, may belong to the same period.

The third chapter deals with the Origins of Rome. M. Pais publishes a remarkable Pompeian painting of the legend of Mars and Vibia, which embodies some elements of that of Jupiter and Juturna. This leads to a discussion of the sacred Fig-tree, and the story of Acca Larentia. Acca is a chthonic deity, and is associated with Jupiter because a sun- or light-god is subject to the vicissitudes of growth and dwindling. Her two legends are analysed, and difficulties explained by topographical association. He fully identifies Acca with a she-wolf, and sees in this a brutal symbolism of the reproductive powers. With much ingenuity he draws a picture of the primitive Palatine community, which is quite without charm.

We have not space to follow M. Pais through his analysis of all the other legends—Tarpeia, Servius Tullius, the Horatii and Valerii, the Fabii, Lucretia and Virginia, Minutius and Maecius. He uses the same remorseless method, and finds them nearly all unworthy of belief; and he sets up his own theories to account for them. This process is necessary, although, as we have said, it is unpleasant; and whatever view other scholars may take, they must not ignore the wide learning and keen insight which are here brought to bear on their destruction. Full as the book is, a great many topics are only alluded to; indeed, there is rather too much of allusion and not enough of lucid summary. "This is not the occasion," "I have proved elsewhere," and like phases, meet us on many a page; and a complete study of the book would imply the consideration of many books and papers, together with very many ancient passages, to which reference is

given in the notes. We are not always convinced, by any means: thus the identification of Tarquinia with Tarpeia, of the good vestal with the traitress, seems to be strained, and it is unlikely that so many legends told of human beings should be due to stories of the gods. The topographical chapters appear to us to be of special importance, since M. Pais has an almost unrivalled knowledge of the sites. Amongst these are the position of the Tarpeian Rock, Roma Quadrata, and the various phases of the earliest Roman city. There are several excursus, and a number of excellent photographic plates; but the passages in the text to which the plates refer are not properly indicated, and there is no index!

REPRINTS AND OTHERS.

STILL in obedience to the suggestions from the Board of Education reprints pour into the market—and, we suppose, into the schoolroom. "Quentin Durward" is edited (2s.) by Mr. Willert for the Clarendon Press: it is admirably printed, and has an introduction which, of course, should be read when the novel is finished; a few necessary notes and a glossary are appended. Messrs. Ginn and Co. publish an edition (by Mr. R. W. Bruère, of Chicago) which contains a free-spoken biography of Sir Walter and notes. The price is 2s. 6d. It is certainly well that the amazing brilliance of Scott's novels should be accompanied in the schoolboy's mind with the ruin which went with it.

Messrs. Macmillan send two of their series, English Literature for Secondary Schools: "Episodes from Southey's Life of Nelson" (10d.) is one, edited by Mr. Spence, and Macaulay's "Warren Hastings" (1s. 3d.) is the other, edited by Mr. Buller, of Clifton College. Each volume contains notes and suggestive questions.

Milton's "Early Poems" and "Areopagitica" are edited by Mr. Goggin and Mr. Watt for the University Tutorial Press, at 2s. 6d. and 2s. respectively; the editions, as usual, are sensible and full of help.

Miss C. L. Thomson has selected and edited poems of Wordsworth (144 pp., 1s. 6d.) for the Cambridge University Press. The notes are, of course, admirable. The Clarendon Press prints Macaulay's Essay and Thackeray's Lecture on Addison, and adds twelve essays from *The Spectator* (152 pp., 1s. 6d.); this is a good way of giving a bird's-eye view of a writer. The editor is Mr. G. E. Hadow. Mr. A. D. Innes edits "Westward Ho!" for the same press (2s.). Macaulay's first three chapters are edited for the Cambridge University Press by Mr. Reddaway (2s.); and are accompanied by an introduction, notes, and an index. These chapters never pall.

Mr. Laurie Magnus's "How to Read English Literature" may be obtained in three forms, and at three prices—1s. 6d. school edition, part i. or ii., 2s. 6d. school edition, parts i. and ii., and 2s. 6d. library edition, part i. or ii. The books are ex-

¹ "Ancient Legends of Roman History." By Ettore Pais. Translated by Mario E. Costanza. xvi+356 pp. (Swan Sonnenschein.)

² P. 20, line 3, reads "seventh" by an error (for "second").

tremely well done, suggestive, interesting; but surely, notwithstanding the preface, not for schools. They are just the books wanted in the library—in the school library, if you like; but not in the schoolroom. All such books are the delight of persons who *have* read.

Mr. L. Marsh has prepared, on original lines, a "Combined Course of Literary Reading and Composition" (Blackie, 256 pp., 2s.). The questions asked seem very useful, and *with a good teacher* the book would undoubtedly succeed.

THE TEACHING OF DRAWING.¹

THE fourth of a series of memoranda on the teaching of various school subjects, which are being issued by the Scotch Education Department, is an important one dealing with the teaching of drawing. This memorandum is in many respects remarkable; in fact, it might almost be described as epoch-making, so drastic and iconoclastic are the reforms which it seeks to inaugurate.

It is to be feared that many of the ideals expressed are, under present conditions, unattainable, and that their realisation would demand the services of experts and specialists of considerably greater attainments than are at present available, at any rate in the average country school. This aspect, however, does not concern us, and we would hasten to express our most complete accordance with the ideals and aspirations which are expressed in the memorandum, and to commend it most sincerely to the attention of all teachers of drawing, whether primary or secondary.

The memorandum disclaims any attempt to lay down a definite scheme, the policy of the Department being to leave their teachers and managers free to formulate their own proposals relative to the needs and character of their individual schools; the intention is to present clearly the end and aim of instruction in each separate branch, and to indicate certain leading principles which should be kept in view in the preparation of detailed syllabuses.

The principle enunciated in the opening paragraph is eminently sound: "The careful study and more or less complete representation of actual objects, natural and fashioned, large and small, singly and in groups, may be looked upon as the foundation of all primary-school drawing instruction."

The memorandum insists on the importance of the pupil being allowed to record the results of his own observation; it speaks emphatically of the futility of diagram copying, and warns the teacher against the present tendency of letting his explanatory sketch become a mere "copy." It condemns the prevalent practice of "lightly shading" an outline drawing as being untruthful, and advocates the representation of tones in their true value "as far as the pupils can see them." In this connection there is a timely and necessary plea for accurate drawing: "The fact that a drawing is to be expressed in tone or in colour should be a reason for greater faithfulness in drawing, and not an excuse for inaccurate work."

The remarks on brush-work should form a salutary check to those misguided enthusiasts who are riding this hobby to death; whilst the strictures on the use of mechanical helps and construction lines, the depreciation of the geometrical models, and the discouragement of the

use of perspective rules, as indicated in the following extracts, are all based on sound educational principles.

From the very beginning the child should be encouraged to observe on his own account, and to record the results of his observations with as much accuracy as he is capable of. Nothing should ever be interposed between him and what he is representing. This principle is a fundamental one, and should be strongly impressed upon the pupil from the start, care being taken to avoid anything which might tend to weaken or confuse the idea in his mind. He should always feel that he is recording his own impressions of something real, and not those of anyone else, however accomplished; so that although his representation may be crude and its accuracy only approximate, it shall be at least an honest attempt of his own to represent what he has actually seen, and as such will afford a firm basis from which he may proceed to more and more accurate renderings.

If this important principle is logically carried out, it is clear that there can be no place in any primary-school drawing scheme for the copying of diagrams or pictures of any description, either printed or drawn. Printed cards or diagrams are, as a rule, either representations of actual objects or examples of abstract ornament. A flat diagram of an actual object, being only a second-hand and more or less imperfect source of information, is not at all suitable as a subject of study. Its use, therefore, deprives the pupil of the really intellectual part of his training, the study and interpretation of reality, and confines him to the mere copying of a copy, an occupation which has but little to offer in return for the educational principles which have been sacrificed.

The teacher should also be very careful how he uses the chalk and blackboard in the course of the drawing lesson. The objections to a printed diagram apply with equal force to a drawn one, and while a blackboard sketch in illustration of a method or principle is often of service in the drawing lesson, the utmost care should be taken that this is never allowed to degenerate into a diagram to be copied or a drawing to show the pupils what they ought to see.

The practice of confining the use of the pencil to outline drawing is not favourable either to the rational development of the work or the mental training of the pupil. For him an outline drawing is a convention so universal that he is bound to accept it, but as a rendering of actuality it is thin, meagre, and unsatisfying. While conventional or dictated shading should at all times be avoided, the pupil should be encouraged to represent the general effects of light and shade as soon as he is capable of seeing and rendering them. Indeed, it should be easier for him to perceive a tone which is there than an outline which is not.

The tones should always be represented in their true values as far as the pupils can see them. An outline drawing lightly shaded cannot be a genuine tone study, and, inasmuch as it is not even an attempt to express the truth, it should never be countenanced. Throughout the whole of this work whatever accuracy of drawing lies within the pupils' capacities should be carefully maintained.

Skill in the use of the brush should be acquired, as in the case of the pencil, by employing it in a rational manner as a drawing instrument from the beginning. No preliminary course of brush marks should be indulged in, nor should the brush ever be treated in any special or exceptional way as a thing apart from the regular drawing lesson. Whether exercises with the brush are included in the syllabus of manual occupations or not, the

¹ Scotch Education Department: Memorandum on the Teaching of Drawing. (Wyman and Sons, Ltd.) (Cd. 3662.) Price 1½d.

whole of this work should be carried on as an integral part of the general drawing scheme, and strictly in accordance with its principles. The substitution of a series of mechanically produced brush markings for the study and representation of the natural forms which they may happen more or less closely to resemble is a singularly perverted and uneducational method of instruction, however showy the immediate results may be.

Where the school has access to a good collection of natural-history specimens, such as properly stuffed birds, a comparative study of the heads, feet, or other characteristic parts of different types forms a valuable exercise. A stuffed specimen should always be rendered frankly as such. Any attempt to represent it as a living creature on a tree or hillside is untrue and undesirable.

A good deal of care should be bestowed on the choice of what may be termed fashioned articles for study and representation. In this work the more or less permanent and lasting nature of most of the material permits of a constant and definite reference from the drawing to the subject, so that the representation may be compared with the original and its accuracy tested at any time. The drawing of rigid objects thus forms an excellent complement to nature drawing, where many of the subjects are liable to constant change, and from their very nature demand a freer and more sympathetic treatment.

In order to secure the full advantage of the training in accuracy of observation and rendering to be gained from the study of rigid objects, the methods of representation must be as simple and direct as possible. All elaborate systems of construction lines should be avoided, and the pupils taught to estimate relative distances and levels, and to compare one mass with another, instead of relying on a mechanical system of arm's-length measurement and angle testing, which in the end proves a hindrance instead of a help to observation. The principles of perspective should be learned from observation rather than by rule.

Imitation flowers and fruit, and cardboard representations of objects, are so obviously out of place in any rational drawing scheme that their introduction should never even be contemplated. The geometrical models, too, for purposes of representation at least, should be set aside as being uninteresting and unnecessary. Their use, even as type forms, is very apt to lead to the substitution of rule for observation in drawing.

Solid objects of cylindrical, conical, rectangular, and other forms, very simple at first and never too complex, should be gradually introduced as soon as the pupils are able to cope with them. In setting groups of objects, incongruities of selection or arrangement should be avoided. The positions of objects relative to the eye-level should be suitably varied from time to time. Objects such as a dovecot, an electric-light pendant, a swinging sign, or a hanging lantern, should always be represented in their natural positions above the eye-level. Similarly, objects the natural positions of which are below the level of the eye should be so placed for purposes of representation. A sufficient number of objects or groups to allow of every pupil having a satisfactory view from within a reasonable distance should always be set up. The necessity for a background in all cases where tone drawings, either in black and white or in colour, are being made, should be strongly insisted on. In some of the higher classes draperies can be introduced for backgrounds.

Throughout the whole drawing instruction the pupil should feel that he is engaged in searching for the true and the beautiful in nature and in art, in recording the truth as he finds it, and in developing his own ideas as

these are evolved. Then, if in some measure this should lead him to the knowledge and appreciation of truth and beauty when he sees them, and should imbue him with the desire to have them around him and with a longing to perpetuate the true and create the beautiful for himself, an important stage in his intellectual development will have been reached.

GEOGRAPHY AND COMMERCE.¹

By GEORGE G. CHISHOLM, M.A., B.Sc.

THE subject chosen for this address is illustrated chiefly by reference to the broad, familiar facts of commerce considered in the light of geographical and other implications that may be described as obvious. As the first of these obvious considerations, it may be pointed out that unquestionably the foundation of commerce is the mutual advantage to be derived from the exchange of commodities produced in different places. Geographical relations are therefore of necessity implied in commerce. But those who carry on commerce have always aimed at the greatest possible advantage to themselves, and the commerce that has always attracted the greatest attention is that which has resulted in the greatest additions to their wealth. Where much wealth is concentrated in the hands of a comparatively small number of people there is sure to be a very profitable trade in things of such value that they can be bought only by the wealthy, things that are more or less rare, such as precious metals, jewels, gems, ivory, fine woods, ornamental skins and feathers, manufactured goods of rare materials or of fine quality, as well as, in many places and in most periods of history, slaves.

With this class of goods may be associated certain others that may be regarded as intermediate in position between those which are bought only by the wealthy and those which are not merely generally consumed but also very widely produced. Amongst these may be mentioned salt, the consumption of which is universal, but the production of which, away from the seaboards of the warmer latitudes, though in a sense widespread, is strictly confined to scattered spots. A more interesting example is that of spices, one of which, pepper, has from a remote period been very generally consumed, but in still smaller quantity than salt, and for that reason has been able to bear still higher transport costs. For ages these costs were very high, for various reasons, amongst which were risks both numerous and great, but the profits of those who were successful in the trade were proportionately high.

Peculiar importance in commercial geography is thereby given to the relations between the regions that yield or yielded spices and those in which they were consumed at a great distance from the place of origin, and one of the most important facts in human history is that for many hundreds of years an extremely valuable trade in these commodities was carried on between India and the Mediterranean.

The routes between India and the Mediterranean were singularly few. They were practically confined for the most part to minor variations in two main routes, one by way of the Red Sea, the other by the Persian Gulf. At more than one period of history, in very early times in the days of the splendour of Assyria and Babylonia, and again in the flourishing days of the Caliphs of Baghdad, the Persian Gulf route had a peculiar advantage in the existence of the large and rich populations that afforded an

¹ Abridged by the author from the presidential address to the *Geographica* Section of the British Association for the Advancement of Science, Leicester, August, 1907.

intermediate market; and another important fact in the relations of geography and commerce, one that has had vast effects on human history, is that the physical conditions of the area between the head of the Persian Gulf and the Mediterranean are, and throughout human history have been, such as to make the most convenient outlet of that route some point or points on that seaboard which in ancient times was known as Phœnicia. Between that seaboard and the Euphrates the desert is sufficiently narrowed to be most easily crossed. As the articles from which much of the wealth of commerce was derived originally came from India, it was natural that the idea should arise that India was a wealthy country, a country well worth possessing. It is perhaps doubtful whether India ever was in historical times a wealthy country in the sense of producing a great abundance of the necessities and ordinary conveniences and comforts of life in proportion to the population, but if it was not rich itself it was at least the means of making others rich. There can hardly be a doubt that the desire of possessing this country of real or imagined wealth was prominent among the motives that led Alexander the Great to embark on that enterprise which had such surprisingly widespread, profound, and lasting effects on the history of the Near East. If we may accept as historical the speech in which Quintus Curtius represents Alexander as having addressed his troops after his victory over Porus, in order to encourage them to advance further into India, that speech affords fairly strong evidence of what has just been stated. "What now remained for them," said Alexander, "was a noble spoil. The much-rumoured riches of the East abounded in those very regions to which their steps were now bent. The spoils accordingly which they had taken from the Persians had now become cheap and common. They were going to fill with pearls, precious stones, gold, and ivory, not only their private abodes, but all Macedonia and Greece."¹ Alexander was no merchant. Pepper was beneath his notice. His symbols of wealth are those which have always most powerfully affected the imagination. Later on, however, we shall meet with a king who was a merchant, and who understood perhaps better than Alexander wherein consisted the value of Indian trade.

At the outset of his career Alexander had destroyed Tyre, thinking, no doubt, that he had thereby wiped away the claims of one rival for a share of the wealth of the East; but it is a noteworthy fact that he did not thereby destroy the value of the site of Tyre under the conditions which then subsisted. Tyre revived and again obtained wealth from its trade with the East, as it did again and again in subsequent history. A heavier blow to Tyre than its mere destruction was the ultimate accomplishment of Alexander's idea for founding a great seat of commerce on the harbour which he saw could be created in the neighbourhood of the Nile delta. The foundation of Alexandria and the successful efforts of the successors of Alexander in Egypt to divert a large part of the trade in spices and other Oriental goods to the Red Sea route for the Mediterranean did more than a single act of war to deprive Tyre and other Phœnician cities of the peculiar pre-eminence which they had long enjoyed in the trade in those wealth-bringing commodities.

But perhaps the history of Venice shows even more clearly than that of Tyre the importance of this eastern trade in connection with certain inevitable geographical relations. The foundation of the future commercial glory of Venice may be said to have been laid when Rome

planted her colonies north of the Po. The gradual clearing of forests gained for agriculture to a greater and greater extent one of the most favoured agricultural areas in Europe. There resulted a superfluity of agricultural products, which begot a trade by sea. The great outlet of this plain in Roman times was Aquileia, which in the beginning of the fifth century, when no one of discernment could imagine that there would ever be other than Roman times, was described by a Roman man of affairs and minor poet as one of the nine great cities of the world. But before that century was out Aquileia was destroyed, never to recover. The value of its site was replaced, and that in a strange way, which no man of discernment could ever have foreseen. The time that saw the destruction of Aquileia and the times that immediately followed were such as made safety a prime consideration, and especially for all who possessed or desired to possess wealth. Refugees from Aquileia, and afterwards from other Italian cities, thought at first of nothing but safety. Many of them found it on a few muddy and sandy islands near the muddy shores of the lagoon in which Venice now lies. But here they found the means of trade. The sea could be made to furnish both fish and salt, and the rivers that flowed into the lagoon enabled them to exchange these commodities for provisions of other kinds which the adjoining land could supply. Gradually this commerce grew, until in the eighth century we find the Venetians trading with Syria and Africa, Constantinople, and the ports of the Black Sea.

Throughout the period of growth the policy of this trading republic, both by land and sea, is very significant. Venice early realised the force of Bacon's maxim "that he that commands the sea is at great liberty, and may take as much and as little of war as he will." Power at sea was necessary to provide security for her commerce. In early times she generally owned allegiance to the Eastern Roman Empire, a suzerainty which could do her little harm and could and did do her much good. To that allegiance she adhered until she was strong enough to turn against and reap advantage from the overthrow of her suzerain. At an earlier date, before the close of the tenth century, she had conquered Dalmatia, and thereby destroyed the hordes of pirates who had found refuge in the innumerable harbours of that coast and constantly harassed the commerce of the Adriatic. At every opportunity she secured establishments and acquired possessions in the Levant.

On the land side, however, dominion would have added more to her risks than her advantages, and that dominion was not sought. For more than eight hundred years after the first flight to the islands of the lagoon, more than six hundred after the election of the first Doge (697), Venice possessed no territory on the mainland beyond a mere narrow ribbon on the edge of the lagoon. The nature of the situation made her indispensable to the trade of the land immediately behind; and while possession on the mainland was not necessary to Venice, she always recognised and sought the advantage of good relations with the occupants of the plains behind her, whoever these occupants might be, and on every occasion endeavoured to turn to her own benefit the vicissitudes of those plains. In her early days she is found now in alliance with the Greeks, now with the Pope, now with the archbishops of Ravenna, and now with the Lombards, just as it happened to suit her interests, and in any case taking every opportunity of obtaining direct and indirect advantages from trade with the most profitable customers in the plains. When famine pursued the steps of the Lombard invaders of Italy in the sixth century, "the Venetians in their

¹ J. W. M'Crindle, "The Invasion of India by Alexander the Great," (1873), p. 215.

pacific retreat," says Mutinelli,¹ "could send their ships to the ports of Apulia and elsewhere to obtain victuals and corn for the famished barbarians," and in consequence the Lombards took them under their protection and granted them security and favours throughout the Lombard kingdom. When Charlemagne, at the invitation of the Pope, invaded Italy to deliver the Church from its subjection to the Lombards, Venetian traders promptly appeared in the camp of the Franks at Pavia and sold to the Frankish chiefs all the riches of the East—Tyrian purples, the plumage of gay birds, silks, and other ornaments, pranked in which the purchasers stalked about in their pride, feeling, no doubt, that now at last they had conquered a land the wealth of which would reward all their labours and hardships.

In further illustration of the nature of the relations of Venice to the North Italian plains, reference may be made to some of the points mentioned in a celebrated and often quoted address delivered to the principal senators of Venice by the Doge Mocenigo just before his death (1423), at the time at which Venetian trade was at the very height of its prosperity. At that time Venice was in possession of a considerable tract of adjacent territory on the mainland, and there was a party favourable to further action on the part of Venice against the growing power of Milan. The aged and sagacious Doge feared that this party was going to gain the upper hand and elect as his successor Francesco Foscari, who, he thought, would involve them in dangerous and disastrous as well as useless enterprises. The immediate occasion of the conflict of views in the Venetian Senate was a request of the Florentines for support against alleged designs of the Duke of Milan. Mocenigo, however, not only warned the senators in the most earnest and urgent language against Foscari personally, but also advised them against the particular enterprise, maintaining that it was of no consequence even if the Duke of Milan made himself master of Florence, since the artisans of Milan would continue to send their manufactures to Venice, and the Venetians would be enriched to the loss of the Florentines. He then went on to give particulars of the trade of Venice at that time, dwelling specially on the value of that with Lombardy.

Mocenigo in this address laid no special stress on the spice trade, but there is not the slightest doubt that spices were amongst the most important commodities with which the Venetians provided a large part of the western world. Just as nowadays the large trade of Britain in bulky goods makes of this country a great entrepôt for the more valuable and less bulky, so in Venetian times the exceptionally large population behind Venice receiving and supplying the bulky goods thus fed the shipping which brought to Venice a much larger proportion of the more valuable goods of the East than was brought to other ports. But there is plenty of direct evidence of the importance of Indian trade to Italy in the Middle Ages. It is significant that a sea-way to India should have been sought by Genoese as early as 1291, and even more significant that a century later Venice should have found it worth while to maintain a consul in Siam.

But the clearest evidence of the supreme importance of the Indian trade to the Italian cities is to be found in the results of the discovery which finally diverted from Venice and the Mediterranean the great bulk of the Indian trade until that trade had lost all the special significance which it had retained for thousands of years. It need hardly be said that what is here referred to is the discovery of the sea-way to India in 1407-9. Of the feeling aroused in Venice by this discovery Romanin has reproduced, from

the "Diarii" of Priuli, an interesting contemporary record, written with reference to a despatch to the Doge probably from Pietro Pasqualigo, a Venetian envoy at Lisbon at the time of the return of the second Portuguese voyage to India under Cabral. The letter is stated to have reached Venice on July 24th, 1501. After giving the letter, in which we are told, among other things, how the Portuguese had charged their ships at Cochin with spices at a price which the writer feared to mention, Priuli adds: "On the arrival of this news at Venice all the city was deeply moved and remained stupefied, and the wisest held it for the worst news that could reach them. For, it being recognised that Venice had risen to so high a degree of renown and wealth solely by the commerce of the sea and by navigation, by means of which every year a great quantity of spices was brought thither, which foreigners then flocked together to acquire, and that by their presence and the traffic they obtained immense advantages, now by this new voyage the spices would be brought from the Indies to Lisbon, where Hungarians, Germans, Flemings, and French would seek to acquire them, being able to get them there cheaply; and that because the spices that came to Venice passed through the whole of Syria and the countries of the Soldan, paying in every place exorbitant duties, so that at their arrival at Venice they were so weighted that what at first was of the value of a single ducat was raised in the end to sixty and even a hundred ducats; from which vexations, the voyage by sea being exempt, it resulted that Portugal could give them at a much lower price."

The effects of this discovery were not long in making themselves felt in the notable diminution in the sales of spices at Venice. Under the date February, 1504, Priuli enters in his diary: "The galleys of Alexandria have entered into harbour empty: a thing never before seen." In the following month the same thing happened in the case of the galleys from Beirut. Under August, 1506, it is stated that the Germans at the fair of the preceding month had bought very little. Various remedies for these evils were thought of, and among these it is interesting to note that in 1504 the Council of Ten seriously discussed a proposal to empower an envoy to the Sultan of Egypt to come to an agreement with him, if possible, for the cutting of a canal through the Isthmus of Suez.

Before going further, however, there is one point in the comments on the discovery of the sea-way to India quoted above from the "Diarii" of Priuli which calls for notice. Hungarians, Germans, Flemings, and French, he observes, will in future go to Lisbon to get the spices of India more cheaply than at Venice. This remark illustrates the difficulty of shifting the geographical point of view according to circumstances, a difficulty of which at all times abundant illustrations can be offered. The purchasers of spices who come first into the mind of Priuli are Hungarians and Germans. It was inevitable that they should be among the leading customers of Venice. The Hungarians were supplied from the Dalmatian ports which belonged to Venice. The Germans came by way of the Rhine and the Elbe, and then across the Alps to get supplies for central, north-western, and northern Europe. But it was neither Hungarians nor Germans who came in greatest numbers to Lisbon to buy the spices which Portuguese ships brought from the East. In any case Lisbon had no advantages like those of Venice for supplying by land a large and rich population immediately behind it. The valley of the Tagus was small and poor, and had not the capacity for expansion in wealth and population which the Lombard plains had when the commerce of Venice began to grow. The bulk of the spices

¹ "Del Commercio dei Veneziani," p. 12.

brought to Lisbon had therefore to reach their final markets by routes that did not pass through Lisbon into the interior. To supply the most important of those markets it was the Dutch, the people who held "the keys of trade" for the important valleys of the Rhine, Meuse, and Scheldt, who came to Lisbon in greatest numbers to buy spices of the Portuguese. And here it has to be added that, in spite of the discovery of the sea-way to India, the Venetians continued to retain great advantages in the spice trade with Hungary and parts of Germany, as well as, of course, the northern plains of Italy. Things did not remain always as bad as recorded in the years 1504 and 1506. The Portuguese, while maintaining successfully for a hundred years the monopoly of the trade in spices at the place of origin in the East, found their advantage in dividing the trade with Europe between the sea-way and the Persian Gulf route, of which latter route they held the key since the final capture of Ormuz in 1515. The trade by way of the Tigris through Baghdad (the so-called Babylon of those days) and the Euphrates to the old Phoenician seaboard was again revived, and was maintained as long as Portugal held command of the trade. It was by this route that the first English commercial expedition to India, that of Newberie, Leedes, Story, and Fitch, went out in 1583, and by which Ralph Fitch, the sole survivor of that expedition, returned in 1591. By this route Venice got back some of her spice trade; not perhaps with the same profit to herself as formerly, but still a trade of no slight importance, not only to Venice, but also to Augsburg, Nuremberg, and some of the other cities of South Germany.

But beyond doubt the bulk of the trade was now carried on by the sea route, and we are thereby enabled to get a better idea both of the amount and the nature of the trade. On both points we get information from the "Narrative" of the above-named Ralph Fitch, who tells us that "the Fleet which commeth every yeare from Portugal, which be foure, five, or sixe great shippes, commeth first hither [to Goa]. And they come for the most part in September, and remaine there fortie or fiftie dayes; and then go to Cochin, where they lade their Pepper for Portugall."¹ Now in 1583 a ship of 500 tons would certainly be called a great ship. In 1572 the largest vessel sailing from the port of London was of 240 tons,² and the largest of the first fleet of the East India Company was one of 600 tons. Probably 3,000 tons would be the outside limit of the aggregate cargoes annually brought to Portugal, for in any case much room in the ships was required for the large crews of those days with their armaments.

Of the commodities sent home from India, Fitch mentions in this place only pepper, and the correspondence of Albuquerque with the King of Portugal soon after the discovery of the sea-way to India clearly reveals how all-important the pepper trade was; but it may be worth while to give the complete list of the commodities which Ralph Fitch enumerates at the end of his "Narrative" as coming from India and the country further eastward. The list is not a long one. It comprises pepper, ginger, cloves, nutmegs and maces, camphora ("a precious thing among the Indians . . . sold dearer then golde"), lignum aloes, long pepper, muske, amber, rubies, saphires, and spinels, diamants, pearls, spodium, and many other kindes of drugs from Cambaia—all of them, it will be observed, having the character of being of high value in proportion to their bulk, so that a very great

value of such goods might be carried in ships of small capacity.

Fitch does not tell us what was sent in return, but information as to that is to be had from other sources, and presents one or two points of interest. In 1513 Albuquerque, after a long course of fighting, concluded a peace with the Zamorin of Calicut, in which it was agreed, among other things, that the Zamorin should supply the Portuguese with all the "spices and drugs" his land produced, and that "coral, silk stuffs, quicksilver, vermillion, copper, lead, saffron, alum, and all other merchandise from Portugal" should be sold at Calicut as heretofore.³ Coral comes first in this enumeration. To us at the present day this does not seem a very important article of commerce, but it was otherwise then. One Mafio di Priuli, writing from India in 1537 to the Magnifico M. Constantino di Priuli, says: "At a great fair which is called that of Tremel I have seen buttons of coral sold for their weight in silver."⁴ Our letter-writer says further in his cheerful, hopeful, gossiping way: "The gains of these parts are other than those of Damascus, Aleppo, and Alexandria: for if one does not gain cent. per cent. from Portugal here, and from here back again, one thinks that one gains nothing. And three or four years would be quite enough."⁵ But, while he indicates how these immense gains are made, he also indicates clearly enough how they continue to be made—that is, how they are so counterbalanced by losses that if these great gains were not made on occasion commerce would cease. It was all very well to exchange your coral for spices, but the great matter was to get your coral out and your spices home in safety. The writer of this letter had entrusted to a friend who had left on a ship for Ormuz jewels of the value of 4,000 Venetian ducats, but the jewels were lost. He believed that his friend was murdered. "But such losses," he adds, "will occur." Another time he lost more than 6,000 ducats gold in Portuguese vessels going to Ormuz, and on another occasion he suffered great loss when Pegu was sacked by the King of Burma.

These notes may serve to illustrate the conditions of trade in the glorious days for Portugal when fine fortunes were heaped up in Lisbon through trade, but the great bulk of humanity got very little, at least directly, through that trade; but we have not exhausted the interest connected with the nature of the outgoing commodities for India, and to that it will be well to return. Another of the stipulations of the treaty of 1513 above referred to was that while duties were to be paid in coin, "the Portuguese were to pay for all the pepper and other merchandise they might purchase in kind," and, as the peace led among other things to a dearth of prizes, Albuquerque "was constrained to send an urgent request home for large quantities of merchandise to be sent out to make up for this deficiency."⁶ But things were certainly different a hundred years later. In the voyages of the English East India Company of the four years 1620-3 inclusive, the value of the bullion (chiefly silver) sent out to India was £205,710, as against only £58,806 worth of merchandise.⁷

Now, what is the meaning of the change in the position of silver in Indian trade which seems to have taken place between 1513 and the end of the sixteenth century? No

¹ Danvers, "The Portuguese in India," vol. i., p. 283.

² P. 34 of the letter referred to as published at Venice in 1524.

³ *Ibid.*, p. 29.

⁴ Danvers, vol. i., pp. 284, 286.

⁵ These figures are taken from p. 6 of the appendix to P. Colquhoun's "Treatise on the Wealth, Power, and Resources of the British Empire," 2nd ed., London, 1875.

¹ Horton Ryley, "Ralph Fitch," p. 61.
² *Ibid.*, p. 17.

doubt we may see there the result of another change in geographical relations brought about by a discovery nearly contemporaneous with that of the sea-way to India—namely, that of the New World. The first result of that discovery of importance to commerce was the pouring into Europe of large quantities of the precious metals, and the quantity was enormously enhanced after the silver mines of Potosi, in Upper Peru (as it was then called), were discovered in 1545. It was probably this discovery that brought it about that, of all commodities of such small bulk in proportion to their value as to stand the costs of transport to the East, this was the one which could be sent out for most part with the greatest advantage. And this discovery no doubt also helps to explain why that of the sea-way to India had so little effect for a very long time in lowering the prices of spices in Europe, why prices even rose. At the time of the return of Vasco da Gama from the first voyage to India the price of pepper at Lisbon is estimated by Danvers¹ to have been about 1s. 5d. per lb., and we all know that the immediate occasion of the foundation of the English East India Company about a hundred years later was that the Dutch suddenly raised the price of pepper against the English from 3s. to 6s. and 8s. per lb.

But the particular commodity which made up the principal portion of the outward trade to India is, after all, a matter of detail, though not unimportant detail. The main point to be emphasised is that, whatever the commodities were, whether carried out or home, the nature of the trade with the East was little if at all altered by the discovery of the direct route to India by sea. The trade still continued to be one concerned in a moderate number of articles of small bulk but high value. It was merely a change of route that the Portuguese effected, and for more than a hundred years they remained in sole command of this route. After that, however, they were ousted from the greater part of this trade, and that the more valuable part, chiefly by the Dutch, and from a geographical point of view it is very interesting to note how the Dutch did it. They did not trouble themselves much about India proper. They left the Portuguese alone at Goa, but, by the confession of the Portuguese themselves, within thirty-six years after the foundation of the Dutch East India Company they established a monopoly of trade from the Bay of Cochin China to the point of Sunda; and not long after they took from the Portuguese successively Malacca, which gave command of the route to the Far East (1641), and Ceylon, almost the only place from which the true cinnamon was to be obtained (1656).

The general character of the eastern trade remained, however, the same. The English East India Company, the operations of which, through the hostility of the Dutch, came to be restricted to India proper, there founded a trade that gave much more opportunity for expansion under modern conditions than that of the Dutch, but for a long time it retained the same character. All the commodities enumerated by Colquhoun as brought back by the voyages of 1620-3 in exchange for the bullion and merchandise sent out were pepper, cloves, mace, nutmegs, Chinese and Persian raw silk, besides calicoes, the sole manufactured article, and one, of course, that had relatively a much higher value than now, when the direction of the trade in that commodity is reversed.

What has brought about such changes, what makes the essential difference between recent and all previous commerce, is the series of enormous improvements in the means of communication which followed so closely on the

invention of textile machinery and the improvement of the steam-engine in this country. These improvements have had two important effects on commerce. First, they have facilitated the maintenance of order and security both by land and sea, and thus enormously reduced the risks of commerce. Secondly, they have directly lowered the cost of transport for different goods in different degrees. Bulky goods of little value could now for the first time be profitably conveyed many hundreds of miles by land to a seaport, and there load ever larger ships for distant shores, thus opening up markets with vast undeveloped resources in the heart of great continents. Along with these bulkier goods the more valuable goods are carried at a cost far below that of former times, so that for such commodities as pepper the mere freight is almost a negligible item.

At the present day there can be no doubt that in point of quantity the spice trade is much larger than it ever was. If Venice could get the whole of that trade into her hands, a thing which she never had, the trade would not now bring her a tithe of the wealth which it brought in the days of her grandeur. It was James Watt, George Stephenson, William Symington, and Robert Fulton, who, without intending it, and without being able to foresee what in this respect they were destined to do, sucked the value out of pepper, and that in a manner which neither the strength of armies nor the subtlety of statesmen could have done anything to prevent.

Now the countries that offer the most attractive markets for the greatest quantities of goods of all kinds are no longer those which look to the spice trade or to trade in any specially valuable commodities for their enrichment, but those which abound in coal so placed as to develop a great amount of manufacturing industry, an industry engaged for the most part in working for the million, not merely in producing the luxuries of the rich. The commodities of very small bulk in proportion to their value now have a comparatively insignificant place.

Perhaps the greatest feature of modern commerce is the unparalleled manner in which it has promoted the increase of population nearly all the world over. Rendering it possible for manufacturing and commercial peoples to depend in a very large measure for their very means of subsistence on supplies brought from the ends of the earth, it is rapidly pushing the settlement of vacant land to the base of the mountains and the edge of the desert. Fifteen years ago Prof. Bryce said: "We may conjecture that within the lifetime of persons now living the outflow from Europe to North America will have practically stopped."¹ We are at least nearing the time when the "new lands" of this earth in the temperate zone will all have been allotted. The results of such a check to expansion after a long period of stimulation to expansion must be momentous, but what the nature of these results will be it is scarcely possible to foresee. It may, however, be regarded as certain that, if we are to be enabled to make any probable forecast as to the course of future development, one of the most important aids to that result must consist in the study of the relations of geography and history from the point of view indicated in the present paper. To study these relations merely with reference to the immediate causes and effects of wars and treaties gives little real insight into the working of geographical influences in history. As in the study of the human body medical men have recognised the necessity of ascertaining with the aid of the microscope the normal functions of the cells of which the body is composed.

¹ As above, vol. i., p. 64.

¹ "The Migrations of the Races of Men considered Historically," in the *Scottish Geographical Magazine*, 1892, p. 419.

the pathological states that interfere with their normal working, and the effects on one part of the body of minute disturbances of function in another part, so in tracing the course of history it is becoming more and more recognised that the minute gradual silent changes must be inquired into and taken into account, not merely in relation to the regions in which they take place, but in relation, it may be, to regions far distant.

THE TEACHING OF HYGIENE IN AMERICA.¹

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OUR laws require physiology and hygiene to be taught to all public-school children. It is a significant fact that excellent modern text-books, the majority of them by biologists (less satisfactory earlier ones were by physicians), are little used. Teachers more often prepare their own outlines, or have an official syllabus. These teachers and officials are neither sanitarians, physiologists, nor biologists. A very few official and medical amateurs in pedagogy believe that to require daily attention to hygienic details is sufficient.

In such schools the resulting instruction in hygiene, both in theory and practice, is brief, desultory, unsymmetric, often misleading, and generally inconsistent. In upper grades particularly it is usually a bore to both pupils and teachers. More than one instructor says with compunction: "I do this like a parrot. I really know nothing about the subject except what books state." Text-books and official syllabuses are beyond the capacity of the average class teacher. Theoretically, all instructors of youth should be able to teach sufficient hygiene. Our quarter-century's experience, however, fails to prove that this is the case; it proves, indeed, that the very great majority of teachers have not been, although laws require their examination in this as in other mandatory subjects.

BETTER METHODS THAN TEXT-BOOKS AND SYLLABUSES.—But the foregoing does not cover all instruction in hygiene. Under the names domestic science, nature-study, physical training, medical inspection, work so good is accomplished in certain cities that these insistently commend themselves as the really efficient methods. These subjects have two characteristics in common: *they vitalise precepts by demonstration and practice, and they are under specially qualified leaders* (teachers, supervising specialists, physicians). The noteworthy result is that the pupils become eager and intent, and the lessons result in marked progress in the use of language, in general ability, and in character.

MEDICAL INSPECTION, PHYSICAL TRAINING, SCHOOL NURSES, AND PARENTS' CLUBS.—Medical inspection instructs indirectly but forcefully by directing the attention of pupils, parents, and the public to the care of the person, to general health and development; to school furnishing, lighting, ventilation, and playgrounds; but such inspection instructs most efficiently through school nurses. It means much in two of our largest cities, where from fifty to eighty trained nurses not only attend to minor ailments at the schools, but daily radiate therefrom

into homes, showing mothers details of cleaning, feeding, clothing children, and of caring for the house. The immediate result observed is that pupils sent home from school by the physician return sooner and in better condition, and that many otherwise unknown wrongs to childhood are reported to the proper authorities for correction.

A valuable supplement is found in mothers' (or "parents," including fathers) clubs. Social devices invite attendance, and under discreet leadership are discussed parental problems, such as clothing, food, amount of sleep, care of teeth; recreations, children's reading, and instruction concerning sex and morality; temperance and cigarettes; communicable diseases. Public illustrated evening lectures on these topics are occasionally given at school houses.

A wide divergence in ideals and practice exists, from almost valueless inspection and gymnastics to alert officials who utilise their opportunities for implanting a fundamental understanding of the habits of health. The best possibilities have not yet been developed to the extent desirable. The true value of active games, athletics and dancing, in combating cigarettes, alcoholic drinks, and other evils, is still to be demonstrated, together with their further usefulness in training for citizenship.

BIOLOGIC STUDIES, HYGIENE, AND COLLEGES.—The most systematic and thorough teaching of physiology and hygiene is found in classes in domestic science and branches of biology (nature-study, botany, zoology). That on many sides, independently, instruction has begun in the application of biologic science to daily living strongly indicates its essential value.

The great hindrance is that institutions training superintendents and principals are so bound by academic traditions that these officials, lacking the all-round intelligence which includes natural sciences and their practical applications, fail to supply this want in children's education as efficiently as the public demands. Neither do our colleges and universities encourage instruction in hygiene, only three out of fifty-six requiring entrance examinations in it.

NATURE-STUDY AND HYGIENE.—A sketch of typical work in nature-study suggests the possibilities inherent in the subject. These teachers have qualified in biology, including related physics and chemistry, with the occasional exception of one without previous preparation, selected because of marked aptitude, and working under the supervision of a specialist. It is possible to develop one such teacher from the staff of nearly every elementary school for pupils under fourteen, provided the supervisor of the science work is a competent official.

Two schools with children from ten to fourteen years of age studied household insect pests. Flies were found much more interesting and injurious than the children had known. The pupils collected eggs, watched them hatch into larvæ, saw the fly come out of the pupa case. They mounted between plates of glass, egg, larva, puparium, male and female flies. They thus learn the life-story of the fly—where it lays its eggs, what flies live on, how they carry filth and disease from sputum and other discharges to the next object visited, which may be one's face or food. The children, almost of their own initiative, started a crusade against uncovered manure heaps, foul garbage pails, and other common uncleanliness; they learned to believe in screens and covered food supplies.

The life-story of mosquitoes, from the "raft" of 180 eggs in a waste-water tub, proved still more fascinating.

¹ Abridged by the author from a paper entitled "Lessons from a Quarter-Century of Legal Requirement of the Teaching of Hygiene: Demonstration and Practice must Supplement Precept; with Pupils over Ten only Special Teachers Succeed," read at the second International Congress on School Hygiene, 1907.

That one insect, according to pupils' own facts and computations, may be responsible for some millions of others within two months aroused special interest in the fate of a cupful of "wrigglers" poured into an aquarium of little fish. Committees, organised for their various neighbourhoods, hunted out stagnant water and applied the kerosene treatment with zest. The Anopheles was found; and flies, mosquitoes, bed-bugs, fleas, rats, and other animals as carriers of germ and parasitic diseases became a live topic.

The life-stories and natural enemies of other vermin were traced—roaches, moths, buffalo bugs, mealworms. The cost of extra labour and of damage to clothes and food was calculated.

The children studied the life-histories of insects destructive of vegetable life. Nearly one million dollars annually is lost by these pests in the United States, and even more by fungous diseases. Popular information in these lines alone would return the cost of instruction many times over. Cats as destroyers of birds (nature's agents in controlling insects) and as distributors of fleas and disease germs began to lose popularity as pets in one neighbourhood.

They studied the life-stories of plants of economic value, including some desirable to introduce for food, and made simple tests for their nutritional value. We use but about 2 per cent. of the 1,000 edible plants known.

One pressing problem is solved by these biologists partly in the work already outlined, but better in other laboratory work that space does not permit to be described: how schools can teach wisely the transmission of life and sacredness of parenthood—instruction which few parents undertake until too late, which many cannot teach rightly, which many never teach at all, neglecting this one of the two vital concerns of living, with so many tragic results to the individual and society. (See References.)

DOMESTIC SCIENCE AND CONTENDING INFLUENCES.—Not only the meaning and value of the gift of life, but the art of making a home—the unit of society—has been omitted from popular education until very recently. Under the name domestic science indispensable knowledge of personal and domestic hygiene is given. Two contending influences have appeared wherever introduced: on one hand short-sighted parents wishing immediate filial service after their own ignorant standards, and equally shortsighted school-men claiming that indifferent cookery and manual work is the basis of better homes to be encouraged by schools; on the other hand the far-seeing, who recognise this opportunity of introducing appreciation of fundamental elementary science and its definite applications into common life that will raise home-making and civilisation to a higher plane.

These two attitudes result in practical differences in classes, convincing intelligent observers that even good manual work is improbable without the discriminating scientific preparation of teachers in physics, chemistry, and especially biology; not only for information, but for the habits of accuracy in observation, in reasoning, in execution, as well as for the superior resourcefulness and personality going with these attainments.

SPECIAL TEACHERS.—When such special teachers are employed one sees cleanliness of utensils, food, room, and person consistently maintained. One must observe several such instructors to appreciate where teaching household sanitation and hygiene should begin when homes do not supplement. After two years' intelligent, painstaking observance of scientific laws one finds a pretty neatness, accuracy, and mental awakening replacing the former slovenliness and vacant expression. A few of the best

schools include boys in these classes, for whom the science and economics of hygiene and sanitation are as essential as for girls.

Typically good courses demonstrate that hygiene and sanitation can be as definitely taught, as accurately practised, as intelligently understood by boys and girls from ten to fourteen years of age as can arithmetic; that it is invariably accomplished by special teachers capable of simplifying fundamental biology, chemistry, and physics for easy comprehension; and that they work under expert supervision.

The classes under the charge of superficially crammed teachers and supervisors likewise demonstrate that to maintain domestic science under such guidance is wasting public funds and discrediting a most valuable opportunity. Mis-statements of facts, dirty finger-nails and improper use of hands, carelessness of dish towels, flies and dust, garbage pails and cupboards, improper serving and eating, confusion and bustle, are common failings. The contrast between the kitchens and classes of consistently scientific teachers and of those where "manual training" ideas predominate suggests that between the sick-room under an anxious mother and under a trained nurse. One has time for all essentials in orderly sequence; the other urges want of time as an excuse for evident shortcomings, while of many she is unconscious.

It seems a wilful shutting of the eyes to obvious facts in the evolution of domestic work, and of women's tendencies since elementary education has been required, to maintain that routine housework, monotonous because of familiarity, isolation, and lack of the stimuli of appreciation, recompense, recreations, and standards, should be more attractive than shop, factory, and office. There is no endeavour calling for higher ability than the making of a home. Since even the humblest needs intelligence, schools fulfil their mission only when they train future home-makers, both boys and girls, in an understanding of the simple laws of science that raises living and "drudgery" into a conscious part of the great scheme of the universe. (See Reference 1.)

CORRELATIONS.—This excellent teaching of hygiene through school nurses, parents' clubs, physical training, nature-study, domestic science, is still heavily discounted by its want of co-ordination; numerous hiatuses, overlappings, and even inconsistencies resulting. Neither is it well correlated with other branches of instruction, which have the same fault too often among themselves. Correlation of subjects is the secret of having abundant time for all essentials of education. Many teachers state that arithmetic is first learned in laying out a school garden—the outdoor laboratory of nature-study—and in running it, or in the laboratory or school kitchen. Among many children's written work I have found the best English, the most logical thought, and the strongest grasp of subject in fifteen papers by children from thirteen to fifteen on "Reproduction in Plants and Animals," based on original observations. Teachers learn that the significance of art first appears to children when planning the details of a home for a family that is to live healthily and happily. Such correlation implies an expert supervisor of science instruction with a comprehensive understanding of social problems and needs.

Another co-ordination is with moral instruction. Several biologists specially mention the alteration in behaviour of many children from eight to fourteen years of age after caring for these fragile plants and animals while making their systematic observations. There came a greater thoughtfulness and gentleness. The faces of unclean-minded

children cleared into frank-eyed interest, and physical habits improved. Accuracy of seeing and speaking, which is truthfulness, distinctly grew, with a sense of protection and justice for the weaker and a judgment as to what is worth while and what is not.

Certainly it would seem as if no words could have the force of this actual study in impressionable years of the Maker's laws of life and its preservation. This method proves the value of temperance more efficiently than statements that children find so difficult to reconcile with observations in their own environments. It is constructive teaching of the elements of normal living as a basis for the negative "Thou shalt not."

Thoughtful people recognise in schools the mental starvation of children from eleven to fifteen whose infancy is prolonged with non-essential superficialities when their whole being is demanding knowledge of vital truths, and likewise recognise in society the evils resulting, even in youth, from ignorance and misinformation often worse than ignorance.

Our social ailments, whether due to love of money, of conquest, of various vices, resulting in ill-health, degeneracies, poverty, criminality, can be remedied only by adding a higher ideal to that now cultivated, which is acquisitive and egoistic (the perfection of the individual); can be remedied only when the plastic childish character is moulded by competent teachers through understanding of the wonderful phenomena of common life and their eternal laws, which are the basis of hygiene—physical morality—and, in the last analysis, of all morality.

One must "learn what is true in order to do what is right."

REFERENCES.—(1) "Report of the Committee to Investigate the Teaching of Hygiene in Public Schools." Published in the Bulletin of the American Academy of Medicine, Easton, Pennsylvania. Section I., "Laws and Text-books," June, 1905; Section II., "The Teaching of Hygiene through Domestic Science and through Nature-study," April, 1906; Sections III., IV., and V. not yet published.

(2) "Biologists in Public Schools an Aid to Morals and Prosperity." An Address. By Dr. Helen C. Putnam. *New York State Journal of Medicine*, November, 1906.

(3) "Practicability of Instruction in the Physiology and Hygiene of Sex as Demonstrated in Several Public Schools." An Address. By the same. *Boston Medical and Surgical Journal*, January 31st, 1907.

(4) "Educational Pamphlets of the American Society of Sanitary and Moral Prophylaxis." No. 2, "Instruction in the Physiology and Hygiene of Sex: for Teachers of Biologic Branches." Address: Dr. E. L. Keyes, Secretary, 109 E. 34th Street, New York.

of the House, Mr. Markham "made an appeal to the Prime Minister, and represented that members were being worn out by the frequent late sittings"; and Sir J. Dickson-Poynder "asked the Government to allow their followers to vote without regard to party allegiance." But from neither physical nor moral restraint was there any release. "The Prime Minister held out no hope of relaxation of the tension." "Mr. Harcourt said he could not consent to liberty of voting." Is this generally known?

FOR what purpose is this discipline exercised—a discipline which reminds us of our own doings in the classroom? It is for "the despatch of business," as the Prime Minister explained it. "One of the difficulties in the way of this despatch," he said, "arose from the presence among them of so many members qualified to speak well on many subjects." Therefore the Parliament, the talking machine, must be prevented from talking, and even from thinking.

"Theirs not to make reply,
Theirs not to reason . . .
Theirs but to do . . ."

and walk into lobbies to which they are driven by "whips." Of course, the Opposition complain of "the inadequacy of the opportunities for criticism of administration," but console themselves with the existence of "another Chamber where freedom of speech was not abolished and over which the Government could not exercise absolute control"; and the Independent Labour Party think "some sweeping and comprehensive alteration must be made in the rules of procedure before they can get through the legislation which is necessary and which the country desires." Evidently the House of Commons is in a "parlous state," at least in the opinion of many.

This summer there have been given many delightful historical lectures. We refer, not to the summer courses of "Extension" or other students, but to the scenic displays known as "pageants" which within the last two or three years have become popular. What has been the exact result of these pageants in the minds of those who, otherwise ignorant of history, have there learnt, for the first time perhaps, of many events, especially in the Middle Ages, which were unknown to them before? They may stimulate some to thought, and a few, even, may be wanting to read. It has been said, indeed, that the presentation of the past has helped to return a Conservative to the House of Commons. But we fear that for the large majority these shows will leave only a confused picture in the mind. They do not of themselves tend to exactness of thought, and the probable result was prettily satirised in an epilogue written for the dramatic performances given at Canterbury during the cricket week there. A pageant is there defined as "an open-air theatrical performance which makes the people of that town believe that all the celebrated events of history occurred on their own town green." It is the teachers in schools who must work to prevent this result.

No more interesting event has taken place this summer than the speech of Sir Edward Fry at the Hague Conference in favour of a mutual agreement among the Powers for a limitation of military and naval expenditure. Respect for "the good grey head that all men know," the weighty words that fell from the speaker, the good wishes expressed on behalf of other Powers, and the way in which the president of the sitting brought it speedily to a

HISTORY AND CURRENT EVENTS.

THE unusual prolongation of the Parliamentary Session this year has brought into prominence certain aspects of our constitution which are not written in our Statute Book, and are too often omitted from our text-books. One of these is the existence of the party system, and the control which the party organisation wields over the members. Lord R. Cecil is reported as saying that "the difficulties which they all recognised were largely attributable to the rigidity of the party system. At present, when a man voted against his party he was at once crushed, and as long as such things went on debates must be unreal, for there was no chance of converting members by argument." From the "Government" side

close, all tended to make that Saturday afternoon one of the most memorable of the days on which the Conference has met. We have said it was "interesting" and "memorable." Can we add that it was "important"? We are afraid not. The official French describes the resolution as a "voeu," which being interpreted means merely a "pious hope." It was carried unanimously, and, indeed, with acclamation, but only because it was a mere expression of desire. "We don't want to fight," but—. We are not rich enough to afford universal peace, not rich enough in mutual love, in knowledge of the highest good, in absence of mutual suspicion, and only too rich in "malice, hatred, envy, and all uncharitableness" to be worthy of the millennium.

ITEMS OF INTEREST.

GENERAL.

THE autumn meetings of the Assistant Masters' Association were held at King Edward's High School, Birmingham, on September 13th and 14th. The council met on the first day and passed resolutions on the subjects of a benevolent fund, arrangements for life insurance for members, and the new Regulations for Secondary Schools. The last-named were as follows: "(a) Curriculum and organisation.—That this association warmly welcomes the decision of the Board to give increased freedom to schools in the planning and working of their curricula. (b) Grants.—1. That this association heartily welcomes the Board's proposals: (i) to pay grants on behalf of all scholars between twelve and eighteen years of age; (ii) to make the term, instead of the school year, the basis of assessment. 2. That this association is of opinion that, owing to the dearth of suitable candidates in some localities, the enforcement of paragraph 20 requiring that 25 per cent. of all scholars admitted to a secondary school shall be pupils from elementary schools may possibly lead to a lowering of the standard of secondary education in those localities. 3. That this association heartily approves of the Board's desire to secure secondary-school scholars from elementary schools at as early an age as possible; but considers that a grant of £2 per head for scholars between ten and twelve years of age is inadequate." All the resolutions were submitted to the general meeting held next day and approved.

THE address of the chairman, Mr. A. A. Somerville, Eton College, touched upon several subjects of importance, not only to the members of the association, but to the profession at large—such as the representation of secondary teachers on the new Registration Council, the importance of some amount of military training in schools, and, above all, the Richmond School case. The judgment lately given was described as one in which it was impossible to acquiesce, and notice of appeal had therefore been given. The report of the executive committee showed that the association had during the year been active in connection with such questions as co-education, on which a valuable report has been prepared by the S.E. Wales branch, the position of masters under the Workmen's Compensation Act, representation on education committees, &c. Three new branches have been formed this year, and the membership steadily increases. A special report on the Richmond School case was presented by the committee to which its conduct had been entrusted. The guarantee fund amounts at present to close upon £900. In the afternoon Prof. Muirhead, of the University of Birmingham, read a very interesting paper on "Religion

in Secondary Schools," which was followed by a discussion, in which many of the members present and others took part. The paper will, we understand, be published shortly in full in the *Hibbert Journal*. It should be mentioned that a very successful dinner of members and their friends was held at the Acorn Hotel on the evening of September 13th, at which Mr. A. A. Somerville presided. The thanks of all who attended the meetings are due to the members of the South Midland branch for the excellent arrangements made by them for hospitality to members from a distance, and also to many prominent residents in Birmingham who were kind enough to entertain members.

THE third annual report of the Education Committee of the County Council of the West Riding of Yorkshire, which deals with the year ending March 31st, 1907, gives an excellent account of the progress made in the provision of secondary education for this important area. In secondary schools aided by the County Council there has been during the year an increase in the total permanent staff from 282 to 331, the increase of forty-nine being made up of one headmaster, one headmistress, sixteen assistant-masters, and thirty-one assistant-mistresses. Last year's report alluded to the necessity for strengthening the curriculum of the schools on the literary side. A marked improvement in this respect is taking place, though much remains to be done. In almost every case where weakness of staff is observed it is found on the literary side. A drawback under which schools still labour is the difficulty of securing competent teachers (more especially masters) of modern languages by the most recent methods. Something is being done to remedy this by the award of grants-in-aid to teachers for attendance at classes at home and short courses of study abroad.

THE West Riding report also states, and we note the fact with much satisfaction, that the average salaries of assistant-masters and mistresses in the schools of the Riding have risen steadily since 1903, and there is no doubt, the report continues, that a corresponding improvement in the quality of the teaching has taken place. It is a little doubtful if the plan outlined in the report as having been adopted by the Education Committee will prove permanently satisfactory. "The committee has recently utilised a valuable source of supply by extending, in cases of special merit, certain county major scholarships on the condition that the holders shall serve for a two years' period in some approved secondary school in the West Riding. Up to now, school authorities have shown themselves very anxious to secure such well-equipped candidates for teaching posts." It remains to be seen, first, whether the "scholar" will leave the profession at the end of the two years, and, secondly, to what extent the schools will suffer from a succession of untrained teachers. The experiment will be watched with interest.

A REPORT prepared by Mr. B. S. Gott, secretary to the Middlesex Education Committee, and Dr. E. W. Maples, assistant-secretary for higher education, entitled "Higher Education in the Administrative County of Middlesex, 1907," contains a model scheme for the regulation and administration of county secondary schools. Herein the functions of governors and their relationship to head- and assistant-teachers are adequately defined. Particularly interesting are clauses 17-20, which deal with the position of assistants. The scheme provides that (1) the governors shall submit for the approval of the County Council a scheme of work and estimate for the ensuing year, show-

ing the number of assistants and the salary to be paid to each, according to the scale of salaries approved by the County Council for assistant-masters and mistresses in secondary schools; (2) the appointment and dismissal of assistants shall rest with the governors after consultation with the headmaster or mistress; (3) the headmaster or mistress shall have the power of suspending any assistant from duty for any adequate cause to be judged of by such headmaster or mistress, but shall forthwith report the case in writing to the governing body.

THE annual meeting of the Trades' Union Congress was held during the first week of the month at Bath, under the presidency of Mr. Gill, M.P. The educational problem was discussed on September 6th, when a resolution brought forward by Mr. W. A. Appleton (Nottingham) was carried by ten votes to one. Chief amongst the demands were: (1) the State maintenance of school children; (2) scientific physical education with individual medical inspection of all children attending State schools; (4) a national system of education under full popular control, free and secular, from the primary school to the university; (5) secondary and technical education to be secured for all by extension of the scholarship system; (6) establishment of training colleges for teachers. A protest was subsequently moved against the class prejudice displayed by the secondary schools branch of the Board of Education, against the action of local education committees in being parties to the raising of secondary-school fees, and proposing to abolish the payment of pupil teachers; a demand was also made for free secondary education for all children capable of taking advantage thereof. The resolution was passed unanimously.

In the forty-four pages of the "Teachers' Classes Handbook" information is given as to a number of courses of instruction for teachers organised by the London County Council for the session 1907-8. "These courses are open without fee to teachers in London schools, whether elementary, secondary, or technical, and are intended to offer to teachers in the various types of schools opportunities for developing their knowledge of different subjects and of coming into contact with those who have made a special study of the subjects in question." A list of the subjects—art, education, English language and literature, geography, history, manual training, dressmaking, &c., mathematics, modern languages and literature, physical education, and science—is given in the first part of the handbook, together with particulars respecting the courses and lectures or classes, times of meetings, latest days for receiving applications, &c.; an appendix follows, supplying a syllabus of the various courses.

A SPECIAL effort is being made by the London County Council to encourage the study of English literature in evening classes. Special lecturers have been engaged to deliver courses on the literature of various periods in twenty-four commercial centres and six secondary schools, &c.; in the latter the lectures will be of a more advanced type.

THE first meeting of the London branch of the Historical Association will be held at University College, Gower Street, W.C., on Friday, October 4th, at 7.45 p.m. A draft constitution will be submitted to the members, after the consideration of which a paper will be read by Prof. A. F. Pollard, president of the branch, on "The Science and Art of History." Further particulars can be obtained from the secretary of the branch, Miss M. B. Curran, 6, South Square, Gray's Inn, W.C.

THE following regulation, supplementary to the Regulations for Secondary Schools dated June, 1907, has been made: The Board of Education may, notwithstanding anything contained in the Regulations for Secondary Schools, 1907, recognise as eligible for grants for the school year 1907-8 a secondary school which, though not on the Grant List of secondary schools for the year 1906-7, was recognised for that year as a pupil-teacher centre under the Regulations for the Instruction and Training of Pupil Teachers, 1906; and such school may receive grants at the rates and subject to the conditions indicated in the Regulations for Secondary Schools, 1907.

A SECTION exclusively devoted to education will be arranged to form part of the Franco-British Exhibition of next year. Mr. McKenna, M.P., the President of the Board of Education, and Mr. John Sinclair, M.P., the Secretary for Scotland, have respectively consented to become honorary president and honorary vice-president of the section. An executive committee has been at work for some time considering the preliminary details, and it will be the aim of this body to secure an instructive display of the various phases of education and to emphasise its importance to the nation. All the principal Government departments relating to education will assist the exhibition.

THE Board of Education has decided to establish a Medical Department to advise and assist in the discharge of the new duties imposed on the Board by Section 13 of the Education (Administrative Provisions) Act in regard to the medical inspection of school children which local education authorities are required by that Act to carry out in England and Wales. The chief duties of the Board in this direction will consist in advising and supervising local education authorities as to the manner and degree in which those authorities carry out this medical inspection; in giving such directions as may be necessary regarding the frequency and method of such inspection in particular areas; and in considering and sanctioning such arrangements as may be proposed under the Act by individual authorities for attending to the health and physical condition of the children. The Board will also collect and collate the records and reports made by the authorities in the process of carrying out the new duties imposed by the Act, and will issue an official annual report on the subject.

THE organisation and personnel of the Board's medical department are not yet fully determined, but in view of the varied factors and influences which are concerned, directly or indirectly, with the health and physical condition of the children of the nation, it has been decided by the Board to establish the department on a broad basis of public health, and so to organise its work as not only to allow of reasonable freedom for local authorities as to particular methods, consistently with securing an adequate degree of uniformity in the presentation of results for comparative purposes, but also to use as far as practicable the means and methods of sanitary administration already existing, and to develop and supplement these as may be found best for the increased requirements, rather than to supplant them or to bring new competing agencies into existence where this may be avoided. As a first step the President has appointed Dr. George Newman as chief medical officer of the Board. Dr. Alfred Eichholz, who has for nine years been on the Board's staff as medical inspector of schools, will also be appointed to the medical department; and further appointments will be made in due course. The Board intends in the autumn to issue a

circular to local education authorities regarding their new duties in the matter of medical inspection of school children.

THE executive of the National Union of Teachers has issued a valuable memorandum on the Preliminary Examination for the Certificate, part ii., 1907. It is pointed out that the questions set were of a higher grade than those of the old King's Scholarship Examinations; that they are undeniably of matriculation standard, and may be welcomed for their encouragement of independent thought and reasoning power rather than memorised knowledge. The syllabus is attacked for being vague, such terms as "wide course of reading," "outlines," "elements," affording too much room for caprice or personal preference on the part of the examiners. The inordinate amount of work expected from the candidates in the prescribed time, and the apparent assumption of their possession of a critical faculty beyond their years, are justifiable causes of complaint. Lack of clearness or of uniformity in directions to candidates, and the probability that quantity is preferred to quality, call for remedy. Of the individual papers, those in geography, history, and English literature are severely handled. The general character of the criticisms, apart from these points, is laudatory; and the Board of Education is commended for its evident intention to compel its examinees to broaden their outlook. The memorandum is evidently the work of someone with close knowledge of the candidates' capabilities, and the criticisms, expressed with moderation and restraint, appear to be both just and judicious. It is pleasant to find the National Union of Teachers seeking relief from trade unionism in attending to education.

THERE is no doubt that the Preliminary Examination for the Certificate, "which has been deliberately remodelled with a view to giving an advantage to those who have been educated and not crammed" (to quote from a recent Blue-book), will soon rank as a leaving examination for pupil teachers equally high with matriculation. In point of difficulty it is well in advance of the Senior Locals. The great increase in the numbers taking the Oxford Senior this year is mainly due to an influx of pupil teachers, who, having failed in part i. of the Board of Education Preliminary Examination, the result of which was announced early in March, devoted the ensuing four months to preparation for the Oxford Senior. Even at so short notice, this examination was successfully taken by 422 pupil teachers. This number must be augmented by many others described as from secondary schools, and it would be safe to assert that more than 500 who failed in part i. of the Preliminary Examination succeeded in obtaining the Oxford Senior certificate. The Board of Education would be well advised to graduate more gently the rising standard of the examination, for it is an open secret that this year, at the last minute, the standard had to be lowered in order to prevent a wholesale massacre.

A COURSE of lectures on hygiene in its bearing on school life, arranged by the Royal Sanitary Institute, commenced on September 30th, and will continue through October. The course is to consist of lectures and practical demonstrations on *personal hygiene*—including elementary physiology, foods and diets, clothing, physical exercise, school accidents, infectious and parasitic diseases; and on *schools, buildings, and equipment*—general and structural, water supply, drainage and disposal of house refuse, air and ventilation, warming and lighting, school furniture, and physical conditions affecting health in school. The various subjects will be dealt with by well-known authori-

ties, and will be illustrated with models and lantern slides. Teachers desirous of attending the lectures are requested to send in their names at once to the secretary of the institute, Parkes Museum, Margaret Street, London, W., from whom the dates of the lectures can be obtained. The fee for the course is 10s. 6d.

MR. BRERETON, the divisional inspector for modern languages to the London County Council, is anxious that the attention of all teachers in modern languages should be directed to the course on phonetics to be given by Mr. D. Jones at Swan Street L.C.C. School, Minories, commencing October 5th. He would be grateful if the principals in the various secondary schools would bring the matter before those of their assistants who are teaching modern languages. Apart from the possible use of phonetics in class, attention may be directed to its high value from the teachers' own point of view in enabling those who have a good accent to preserve it from degenerating. It cannot be too strongly urged that mere attendance alone without practice will very possibly do more harm than good in confirming the belief in the accuracy of one's accent. In fact, it is not unusual to meet teachers who, having been hearers only, have never realised how far their own spoken words fall short of the standard French pronunciation. For the practical teacher phonetics is an art. He only requires to know enough of its scientific side to be able to have an intelligent understanding of the basis on which it repose. He is, in fact, in the same position as a person learning a musical instrument, which in this case is represented by his own organs of speech. A very little knowledge of the theory of music is requisite; what is really needful is perpetual *practising*.

THE third International Congress for the Development of Drawing and Art Teaching is to be held in London from August 3rd to August 8th, 1908. The congress exhibition will probably be opened about a week earlier. It will certainly remain open after August 8th. Official invitations are to be sent to all foreign Governments through the British Foreign Office. All exhibits intended for the exhibition must be sent in by June 1st, 1908. All papers for the congress must be sent in by May 1st, 1908: they may be written in English, French, or German. So far as possible, arrangements will be made for the exhibits of the various nations to be in charge of representatives who can explain their scope and purport in the three official languages of the congress, English, French, and German. Arrangements are being made for the appointment of local treasurers and secretaries in all foreign countries, the former to collect and transmit membership subscriptions, the latter to disseminate information and answer inquiries. Such officers have already been appointed for France, Germany, and the United States. The United States is making arrangements to send 200 art teachers over to attend the congress. With regard to Great Britain, local exhibitions will be organised throughout the country, from which exhibits for the congress exhibition can be chosen. Any further information can be obtained from the organising secretary of the congress, Mr. C. M. Mathews, 151, Cannon Street, London, E.C.

THE University of London has just published (price 3d.) a useful pamphlet containing general information for internal students. The pamphlet is of the nature of a prospectus showing the constitution and work of the University, and it should be particularly helpful to students who have matriculated and are desirous of pursuing their

studies in London. The institutions recognised as Schools of the University in one or more of the Faculties of the University are briefly described, and a map of London is included showing the distribution of these colleges and of other institutions having recognised teachers. From a statistical summary we learn that 6,250 candidates presented themselves at the general matriculation examinations in 1906, and 2,689—about 42 per cent.—passed. Candidates for matriculation by school examinations numbered 408, of whom 195—nearly 48 per cent.—succeeded in passing. Fifty candidates obtained the teacher's diploma in 1906, and 224 is the total number of students who have obtained this diploma since it was instituted.

AT Bedford College for Women (University of London), two courses, open free to teachers in London schools, have been arranged for the Michaelmas term. The two courses are: (1) "The Organisation of Nature-study Courses in London Schools" (lecturer, Miss M. R. N. Holmer), Saturdays at 10.30, beginning October 5th; (2) "Geology for Teachers of Physical Geography" (lecturer, Miss C. A. Raisin, D.Sc.), Wednesdays at 6 p.m., beginning October 9th. Syllabuses can be obtained on application to the principal.

A COPY of the Calendar of Birkbeck College, London, for 1907-8 has been received. The calendar gives details of syllabuses, suitable text-books, scholarships, prizes, &c., and it should be of service to students preparing for examinations of the University of London or of other examining bodies.

THE Civil Service Commissioners have announced an examination for two assistants in the Exchequer and Audit Department of the Admiralty. The examination begins on November 5th. The syllabuses of subjects appeared in vol. viii., p. 193 (May, 1906), and the regulations are the same as for the Army Accounts Department, which appeared in our issue for May of this year.

CANDIDATES who wish to sit in November for the competitive examinations for entrance to Sandhurst and Woolwich must make application before October 15th to the Secretary, Civil Service Commission, Burlington Gardens, W., from whom full particulars can be obtained. The syllabus is outlined in THE SCHOOL WORLD, vol. viii., p. 109 (March, 1906).

THE London County Council gives notice that examinations for appointments in lower sections (a) and (b) of the minor establishment will be held on Tuesday, November 12th, and the following day. Candidates for appointment in (a) must be more than fifteen and under eighteen years of age, and in (b) more than twenty and under thirty years of age, on October 14th, 1907. Candidates must send in their applications to the Clerk of the Council, County Hall, Spring Gardens, S.W., by 11 a.m. on Monday, October 14th, and must pay their fees (2s. 6d. and 5s. respectively) on November 7th for (a) and November 8th for (b). Particulars of these examinations may be found in THE SCHOOL WORLD (vol. viii., p. 430, November, 1906), or may be obtained from the County Hall.

MR. A. W. PRIESTLEY, for many years house-master at the Junior House, Claresmore School, Pangbourne, has been appointed headmaster of Daventry School, Northamptonshire.

IN the notice of Mrs. A. H. Christie's work on "Embroidery and Tapestry Weaving" in our August

number, reference was made to the author's position at the Royal School of Art Needlework. We are asked to say that the reference should have been to the Royal College of Art.

SCOTTISH.

THE Education (Scotland) Bill has failed to pass. For the fifth time in succession the pressure of parliamentary work has blighted the hopes of Scottish educationists. Six precious hours were given to the discussion of what should constitute "milk-blended butter," but for the genuine milk of the word no time was to be had. For the loss of the Bill the Government must be held to be primarily responsible. The regular Opposition again and again expressed their willingness to facilitate the progress of the measure, but there appears to have been differences in regard to certain provisions in the ranks of the Ministerialists themselves. At the same time, it should be gratefully recognised that Mr. Gulland, M.P., Captain Pirie, M.P., and several other Liberal members did their utmost to secure consideration of the Bill. Sir Henry Craik, M.P., and Mr. Duncan, M.P., on the other side were equally indefatigable in their efforts.

SIR CHARLES BINE-RENSHAW, in opening a new school at Langside, Glasgow, referred to the loss of the Education Bill and the injury that was being done to education by these repeated failures. He would not regret the loss of the last Bill if in a future one some effort was made to grapple with the question of grouping parishes and areas suitable for higher education. As a preliminary he suggested that a small commission might be appointed to go through Scotland and undertake the work of delimiting such areas.

THE experiment of holding a vacation school in Dundee has proved so successful this year that an effort is to be made to continue it in the future. This year all the expenses have been met by voluntary effort, but it is certain that this source cannot be relied on year after year. The founders of the movement are therefore anxious to secure departmental recognition and financial support for their labours. The movement is, however, a social rather than an educational one, and the Department may have some difficulty in granting the request. If so, this seems to be pre-eminently a case where the local municipal authority should step in and bear a considerable share of the financial responsibility.

ST. GEORGE'S Training College for Women Teachers, Edinburgh, has been officially recognised by the Provincial Committee as a centre for training teachers of higher subjects. Excellent work has been done here in the past with but scant official recognition. It is satisfactory to find the college likely to be now placed on a basis of sound financial stability.

IRISH.

THE Intermediate Education Board, in making known the results of the examinations last June, introduced a precedent which has great conveniences, and should, if possible, be followed in future years. The Board published in the middle of August a provisional book with the results. The final official results were also published before the end of the month; but the provisional lists gave heads of schools ample time before reopening after the summer vacation to take advantage of the results in arranging their classes. The marking this year seems to have been severe in French and geometry. The general results are as follows:

Boys.

	Senior Grade	Middle Grade	Junior Grade	Preparatory Grade	Total
Number examined ...	464	1411	3937	2353	8165
Number who passed—					
With Honours ...	146	243	471	—	860
Without Honours ...	166	600	1644	1394	3804
Total ...	312	843	2115	1394	4664
Proportion per cent.					
of those examined					
who passed ...	67·2	59·7	53·7	59·2	57·1

Girls.

	Senior Grade	Middle Grade	Junior Grade	Preparatory Grade	Total
Number examined ...	213	585	1902	956	3656
Number who passed—					
With Honours ...	50	91	185	—	326
Without Honours ...	95	226	874	575	1770
Total ...	145	317	1059	575	2096
Proportion per cent.					
of those examined					
who passed ...	68·1	54·2	55·7	60·1	57·3

THE Department's summer courses for teachers lasted from July 9th to August 2nd. There were seventeen public courses and thirty-eight convent courses; six other courses began on August 6th, and lasted until August 31st. The following statement shows, in comparison, the figures of the courses for 1906 and 1907:

	1907	1906	
Total number of courses	{ Public ...	20	22
	{ Convent ...	41	52
Total number of students	{ Public courses ...	489	499
	{ Convent " ...	252	290
Number of centres	{ Public ...	7	9
	{ Convent ...	23	21
Staff instructors engaged	{ Public courses ...	64	73
	{ Convent " ...	38	44

THE Department has also issued an important explanatory circular with regulations for the session 1907-8 relating to the programme of experimental science, drawing, manual instruction, and domestic economy for day secondary schools. It is in three parts. Part i. contains the official calendar for the year. Part ii. is addressed to managers and principals, and contains a new rule, which is underlined. The names of all pupils working a second time through one of the syllabuses of the programme should be notified to the Department at the beginning of the session, so that the Department's inspectors may visit the school, where necessary, to decide on their eligibility for promotion. Part iii. contains the regulations for the administration and distribution of grants under the Department's scheme.

THE report of the president of Queen's College, Belfast, for 1906-7, is again satisfactory, and shows educational progress in the north. Strong representations are now being made to the Treasury concerning the enlargement of the library, which is urgently needed. A large addition has been made during the year to the laboratory accommodation, the Treasury having given £5,400 for new buildings, and a similar sum being provided by the better equipment fund. Dr. Hamilton adds a note on the university question, and the interest of the Queen's College in its solution. He is anxious for its early settlement. He says rightly: "This college and the entire higher education of the country have long suffered most seriously from the defective national provision for this purpose, and must continue to suffer until Parliament places it upon proper lines."

A NEW sixpenny monthly, *The Irish Educational Review*, is announced to make its first appearance early in October.

Devoted to the interests of Irish educational advancement in all grades—primary, intermediate, university, and technical—the new review will have a wide field for the exercise of a useful influence. The contents of the first number will include a contribution on the university question, by Dr. O'Dwyer, Catholic Bishop of Limerick; "State Aid and Rate Aid," by Prof. Windle, president of Queen's College, Cork; "Some Remarks on Primary Education in Ireland," by Monsignor O'Riordan; and articles by Miss Mulvany, principal of Alexandra School, Dublin, and other writers. The publishers are Messrs. Browne and Nolan, Ltd.

WELSH.

IN the House of Commons, Mr. M'Kenna has given the assurance that the institution of a Welsh Department for Wales will not lessen the grants for intermediate education in the Principality. Mr. M'Kenna states that the Welsh grants will be earned by the schools; and the total amount paid to the schools in respect of all pupils in Wales will be the full share which Wales is entitled to receive in proportion to the grants paid in England.

GREAT dissatisfaction has been expressed by teachers at eight of the schools in the Pontypridd district on account of regulations proposed for the coming winter session of the evening classes. These teachers decline to undertake the continuation classes unless they are reassured of alteration. The grounds of complaint are said to be dilatoriness in payment of teachers' remuneration by the county authority, and that the authority had not refunded students their entrance fees when they had made the required attendances. Eventually a resolution was passed by the Pontypridd Committee requesting the teachers to specify their complaints.

IT appears that in connection with the Swansea Voluntary Schools the managers now claim to have provided sufficient playground accommodation for 900 children. This will involve an expense of between £2,000 and £3,000. The total sum still required for the whole of the Swansea Church Schools is put at £5,000.

BARRY is well known for its enterprise in education. The new Gladstone Road Council Schools have been completed at a cost of about £17,000. They provide accommodation for 1,200 children. The schools are described as the best in the town, and amongst the best equipped in the Principality. Barry is said to have expended nearly £150,000 upon its elementary schools. In the Gladstone Road new schools, the class-rooms are designed to accommodate from forty to fifty scholars in the boys' and girls' departments, and a class-room for infants for thirty-six.

MR. TOM JOHN has directed attention to the wretched conditions under which the Pontyclun non-provided schools are conducted. Mr. John's letter is accompanied by a long statement of facts relating to the staffing and furnishing of the schools. As regards the staff, he points out that continual changes are taking place, and he quotes several cases in proof. His Majesty's inspector, he adds, on May 5th, 1905, pointed out that "the staff should be strengthened immediately by the appointment of at least one assistant," and for twelve months nothing was done beyond sending four supply teachers from all parts of the county for thirty attendances. From a teaching point of view, Mr. John says, "this was absolutely worthless." As regards furniture, apparatus, &c., his Majesty's inspector, in his report in February, 1905, said: "The school is ill-equipped with reading books and maps. There is no map of Europe, and the map of England and Wales is

so disfigured that it is useless for teaching purposes." Mr. John says these articles had been applied for by the head-teacher, who made a further application in March of the same year, without result. In May, 1905, his Majesty's inspector reported that "the desks are insufficient and rickety"; and Mr. John adds: "The state of the furniture is so bad that no description will do it justice. The head-teacher wrote to the secretary of the local education authority on May 8th, and again on July 7th, 1905, pointing out the condition of the desks, that a child had been hurt through a loose seat falling on her foot, and that a boy was away from school from May 18th to June 12th on account of blood-poisoning, caused by a splinter from a worn-out seat entering his leg. In May, 1907, a seat with six boys on it fell, the legs of one child being under the seat. At the present time some of the children have to sit on the floor. All that has been done during the last four years to improve the desk accommodation has been to send eight second-hand desks from a council school. Of those, two were unsuitable—one was in pieces."

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Gréard, Un Moraliste Éducateur. Publié avec une préface par Léon Bourgeois. By M. P. Bourgoin. viii+386 pp. (Hachette.) 3 fr. 50.—This charming volume should be read by all interested in the improvement of our educational organisation. Here we have sketched by one of his most devoted pupils the biography of the man who was more concerned than anybody else in the transformations effected in French public education in the latter half of the nineteenth century. Two-thirds of the book are devoted to the account of the organisation of elementary education and courses for adults and technical schools when Gréard was Directeur de l'Enseignement Primaire de la Seine, and to the reforms in secondary and higher education while he was Recteur (1879-1902). The writer convinces us throughout that Gréard was always superior to the task in hand; in fact, he would appear to have cherished obstacles, for it was he who declared that "pour l'administrateur, les difficultés sont le ressort de l'action." Especially interesting is the balance Gréard seeks to maintain between the partisans of the classic and modern sides, and his success in evolving syllabuses answering "à la fois aux besoins supérieurs de la culture générale et aux nécessités pressantes de la vie contemporaine." A few glimpses of Gréard's private life at Villers-sur-Mer form the subject of a separate chapter.

Der goldene Vogel and other Tales. By Walter Rippmann. viii+88 pp. (Dent.) 1s. 4d.—The five stories of which the simplified text is given in this German reader are Andersen's "Nightingale" and "Pinetree," Grimm's "Golden Bird," Hauff's "Kalis Stork," and the Japanese tale of "Urashima Taro, the Fisher Lad," which Prof. Rippmann has himself done into German. An English rendering of this story appears in "The Japanese Fairy-book," compiled by Yei-Theodora-Ozaki, and published by Messrs. Constable and Co., Ltd. The text of the book is divided into thirty sections, and a very instructive set of exercises is given in each section. The stories provide easy and interesting reading for young students of the German language. Prof. Rippmann has reduced the teaching of German to a fine art in his (new) First German Book and this Reader, and the two books together represent methods

of modern language instruction in their best educational form. A few appropriate pictures would have added to the attractiveness of the Reader.

Le XIXe Siècle. Napoléon Bonaparte: Les Facultés Maitresses. Par H. Taine. *Caractères Généraux de la Civilisation Moderne.* Par A. Rambaud. Edited by H. Cammartin and C. E. C. Hanbury. 62 pp. (Dent.) 6d. net.—This book forms vol. i. of the "Extracts of French History for Fourth Year Pupils." After being promised illustrations where possible, it was disappointing not to find a map. Both the text of "N. Bonaparte" and the notes on it need thorough revision. The most glaring error appears on p. 5, where note 4 explains *partant de* as equivalent to *basé sur*, an elucidation as absurd as it is incorrect. More care has been taken with the second part of the book, which is a reproduction of the chapter in the author's "*Histoire de la Civilisation Contemporaine en France.*" Exercises on the usual lines follow the fifteen sections into which the book is divided, and a list of books worth consulting is supplied.

Classics.

A Victor of Salamis: a Tale of the Days of Xerxes, Leonidas, and Themistocles. By W. S. Davis. x+450 pp. (Macmillan.) 6s.—Most of us have suffered in our young days from Bekker's "Gallus," which pretended to be a story and was a very different thing: we may also have read other attempts at making the classic ages live, attempts more or less successful, but always suggesting the powder under the jam. Here at last is a really interesting story of the days of Salamis. The author has chosen a great time, when events moved fast; and he has introduced us to several of the phases of Greek life—the Games, the Panathenaic Procession, Thermopylae, Salamis, Plataea, a sea-chase, a kidnapping. All these show the lively and adventurous side of life: there are only hints of such things as the law-court and the ecclesia, and nothing about the drama, or country life, practically nothing about life in the home. But the episodes chosen are just such as will interest the young. The hero also is taken to the Persian Court, and sees the Persians at home; and our author has been successful in enlisted our sympathies for the enemies of Greece as human beings. He has been very merciful with the powder. Most of it comes in naturally, and a reader will certainly carry away something of the atmosphere of ancient life; very rarely do we feel that a sentence or two comes under the head of useful information, since this is usually involved in the story. It is a very great pity, when the book has been planned so well, that it is full of mistakes in elementary Greek. Take these: *philotate* (m.), *philotata* (f.), *makaire* (m. voc.), *Orehus*, *Zeus Orchios*, *Bædromion*, *Lysistra*, *Cylene*, *Pollicharmes*, *Morae* (the Fates). There are also anticipations of modern Greek, or at least Hellenistic, as *kyrie* (once for *despota*, often for sir), *Daphni* (between Athens and Eleusis), *Alpeni*; and an occasional Americanism, as *back of* for *behind*. The Persians also use the word *dæva* for *dævæ*, which is trisyllabic in Zend. We also read **ΦΟΙΝΙΞ ΤΙΟΣ ΓΛΑΤΚΟΝΤΟΣ**. A Greek scholar could easily have corrected these on the proof. The opening scene, again, is rather Newmarket than Greece, with its bookies and its odds. It is perhaps out of place to expect any great subtlety in characterisation; for the most part the characters are a little wooden, and the treachery of *Democrates* is crude; but an exception must be made for *Phormio* the fisherman and his shrew of a wife—there is a specially delightful touch on p. 146,

for which much may be forgiven. But after all the story is the chief thing, and that certainly moves and holds the reader.

The Book of Isaiah according to the Septuagint (Codex Alexandrinus). Translated and edited by R. R. Ottley. II. Text and Notes. xxxiv+418 pp. (Cambridge University Press.)—The study of the New Testament is, we are glad to see, being carried on more intelligently than it used to be. We do not here speak of scholars, although even they have had to bear the blame of isolating New Testament language from contemporary literature and thought, but of the schoolmaster and the schoolboy, and of the average university man. It was admitted at least that the Septuagint ought to be studied; yet there were few helps for the student even for that. Now, thanks to the work of the Cambridge scholars, the text of the Septuagint is being sifted, and, at the same time, something is being done to enable the ordinary student to understand it. We reviewed lately an excellent selection published by Messrs. Ginn, and this edition of a difficult book receives a hearty welcome. The introduction discusses with learning and good sense the genesis of the Septuagint. Mr. Ottley does not place high the value of the text as an aid to the criticism of the New Testament, but it has its value, nevertheless. As to the Greek style, new discoveries will probably modify his opinion that the version had little help from the literary men of the city, especially as he already sees that the translators were not profound as Hebrew scholars. The version of the Pentateuch, he remarks, deserves special respect. As a basis of the text in this edition, he takes A, adding the chief variants of B, with a selection of variants from the cursives, which he classes provisionally as Hexaplaric, Hesychian, and Lucianic. The commentary breaks new ground, as there is practically nothing available for the ordinary student; and it includes subject-matter, language, and text, with especial regard to the relation of this text to the Hebrew. In his interpretation, the author takes his stand boldly as a defender of predictive prophecy, and in particular refuses to explain away the allusion to Christ's birth in 7¹⁴. He does not notice, however, the suggested interpretation of "the virgin shall conceive," which might have been said of any woman and her first-born, and need not imply a virgin birth in the accepted sense. The illustrative notes are very full and interesting, and the book is certain to be useful.

Herodotus IV. to VI. Translated by G. Woodrouffe Harris. 165 pp. *Plutarch, Lives of Sertorius, Eumenes, Demetrius, Antonius, Galba, Otho.* Translated by W. R. Frazer. 244 pp. (Swan Sonnenschein.) 3s. 6d. net each.—Much the same must be said of these volumes as of those which preceded them. We do not feel confidence in Mr. Harris as a translator. Take, for instance, the story of Heracles in iv. 8 ff. The sentence *τὸν δὲ ὕκεανὸν λόγῳ μὲν λέγοντος ἀπὸ ἥλιου ἀνατολέων ἀρξάμενον γῆν περὶ πάσας θέους, ἔργῳ δὲ οὐκ ἀποδεικνύσαι* appears as follows: "The ocean, of course, has its source where the sun rises, and circumvents the whole world. This is merely theoretical." Chap. 9: *Ἴππους μὲν δὴ ταύτας ἀπικομένας ἐνθάδε, ἵππασά τοι ἔγώ, σῶστρά τε τὸ παρέσχες.* *ἔγώ γιρέ σεν τρεῖς παῖδας ἔχω.* "I kept these mares that came to me, but you have paid for their keep. I have three children by you." Besides the mistranslations, the relation of the thoughts (e.g., γάρ) is lost here and elsewhere in the story. In chap. 12 we read of the city "Sinopis"; in chap. 14 *τῶν ἀστῶν οὐδενὸς γένος ὑποδέστερον* is rendered "whose family was in no way inferior"; in chap. 16 *φαμένον* is omitted; in chap. 17 *ἀροτῆρες* is rendered "menial"; in

chap. 23 *σῶρες ἄνδεινοι πέντεπέων*, "livers on trees," which Mr. Harris says they "devour." Enough has been said of this book. The Plutarch is better done, and we are glad of anything which may induce people to read Plutarch; but the style is commonplace. Each of the books has an index, that of the Plutarch being fairly full (12 pages).

Excerpta Brevia. By W. H. S. Jones and R. Parker Smith. Text, 88 pp.; vocab., 51 pp. (Blackie.) 1s. 6d.—This is a collection of Latin passages in two parts. Part i. contains in fifteen pages thirty short extracts from Catullus, Martial, Ovid, Vergil, Cicero, Livy, Nepos, and Pliny, "suitable for learners on their first introduction to a Latin text after a year's course, such as that given in Scott and Jones's 'First Latin Course,' on the simple sentence." Part ii. consists of thirty-nine longer and more difficult passages covering a wider range of authors; they are mainly historical, and their leading idea is to "show why the Romans were a great people." The selection is attractive and interesting. All vowels long by nature are marked as in Blackie's Latin Texts. There are, of course, some oversights—e.g., *āc* is several times left unmarked, and the first vowel of *posco* is short. The preface speaks of a blank page for teacher's notes, but there is none such in the book. We prefer references to authors to be given with each extract rather than, or as well as, all together; we have made no attempt to verify them generally, but 2 should be Catullus 49 (not 19), 68 Propertius V. 1 (not IV. 1), and Tacitus *Germania* would be more satisfactory than *de situ* for 63. There are some omissions in the vocabulary; e.g., *licens* and *lustrum* (both on p. 84); and where does *armum*, a *weapon*, occur in Latin in the singular? The marking of long vowels necessitates giving fuller forms of the parts of some verbs; e.g., *singō*, -*cre*, -*xi*, -*ctum*, is not satisfactory for the perfect. The first vowels of words like *magnus* and *ignis* are marked long, as in Blackie's Latin Texts; there is, however, no conclusive evidence for this; and before things go too far the Classical Association should give some ruling on this and other moot points.

Caesar, Gallic War, Bk. VII., xi+56 pp. By Dr. W. H. D. Rouse. *Virgil, Georgics, Bk. III.*, xvi+19 pp.; *Bk. IV.*, xvi+19 pp. By S. E. Winbolt. (Blackie.) 6d. each net.—These editions of Blackie's Latin Texts not only complete Dr. Rouse's edition of Caesar's Gallic War and Mr. Winbolt's Virgil, but also the whole series as at present advertised. We have noticed few mistakes in the marking of the quantities; they occur in Georgics III. in vv. 103, 344, 435, and 542, and in IV. in vv. 235, 355, and 514. The chief ones in the Caesar are: *ὅμνες* (16. 3), *quīntīs* (36. 1), *fēcerit* (38. 10), *Haeduōs* (39. 1), *quantōpere* (52. 3), *recipiātūr* (66. 7), *consobrino* (76. 4), *ἄ* (82. 1). In c. 35 the MSS. reading *captis* and the v. l. *carptis* should have been given in a critical note on *correptis*. The introduction (p. vii) might have made it clear that only a summary of Bk. VII. is given. There is an improvement in the note on *Synizesis* in the introduction of the Georgics, but several other points still await correction.

English.

The Poems of William Dunbar. Edited by H. B. Baildon. 395 pp. (Cambridge University Press.) 5s.—This is one of the many books which have been wanted for a long time. No edition of Dunbar has been procurable by the humble student; and an introduction such as Mr. Baildon's, which is mainly phonological, is more necessary than biography, history, or criticism. Indeed, it is a mercy to be rid of them; and the student can get

his information from a good library. The "Lament for the Makaris," the "Thrissill and the Rois," and the "Dance of the Sevin Deidly Synnis" are perhaps known best from anthologies. But with this volume it is possible to form one's own opinion on Dunbar's debt to Chaucer and on Burns's debt to Dunbar. Perhaps in a second edition Mr. Baildon will give us a little more in the way of bibliography, and a note on early Scottish poetry. The glossary and notes are admirable; of course, the book is not for school classes, though Dunbar's philosophy is for all:

"Off wairdis gud and grit richess
 Quhat fruct hes man but miriness?
 Thocht he this wairld had eist and west
 All wer pouertie but glaidness:
 For to be blyth' me think it best."

The Growth of English. By H. C. Wyld. 199 pp. (Murray.) 3s. 6d.—This book, like everything else on English from Prof. Wyld, is thorough, accurate, and interesting. The first seven chapters are phonological and necessary; and they are, unlike such chapters in the usual books, quite elementary. Teachers will object that no phonetic transcript is used; and, indeed, faster work will probably be accomplished with one of Dr. Sweet's alphabets: but our author has purposely omitted in this smaller book the transcript used in his larger book. The writer will not, in chapter vi., escape criticism, for he seems to have drawn on his own experience only, a perilous thing for a phonetician when dealing with changes going on to-day. The second half of the book is historical, and it is a good introduction to larger volumes. It is doubtful if English philology as a class subject will ever be popular now that examiners are fighting shy of it, but it will always be fascinating to the student. The book, unlike its elder sister, has no index.

FOUR books, which are part of a series and deal with English literature from 1625 to 1780, are sent by Mr. Murray. They are all prepared by Mr. Edmunds and Mr. Spooner. The first is the "Story of English Literature" (3s. 6d.), and it acts as a guide and critic for the student; its accompanying volumes are "Readings in English Literature," senior course (3s. 6d.), intermediate (2s. 6d.), and junior course (2s. 6d.). The longer books contain about 350, the shorter about 250, pages. The criticism and the extracts are both admirably done; it does not seem to us quite clear whether or not the student who uses all these books in turn is supposed to dip into the "Story" three times as he reads his three readings, but this may be clearer in practice. Perhaps it would be well in the interests of the schoolboy and schoolgirl to add a note or two when biographers and critics vary very greatly in their estimates of men and books. Defoe, Swift, Chaucer; what vehement praise and dispraise, admiration and condemnation, are called up by these three names. Is it well to let the young person think that everyone did and does condemn Defoe, admire Swift, and neglect Chaucer? Better to say plainly that our criticism is, like our decade, hastening to the judgment seat of posterity. Very little criticism is final.

THE S.P.C.K. is in the market bidding against the penny shocker; and it is time that someone tried to capture the reading youngster. We have before us the "Carved Cartoon" (A. Clare), "The Pirate Slave" (H. Collingwood), "Sail Ho" (G. Manville Fenn), "Slavers and Cruisers" (S. W. Sadler), and "Born to Command" (Gordon Stables). All are illustrated, attractive in look, and 6d. each. Probably the books are in-

tended for the schoolroom, but the cheap school library ought to have them too. Unfortunately, not all our schools have libraries, not even cheap ones. There is not enough money in all quarters to spend on essentials.

The Main Tendencies of Victorian Poetry. By Arnold Smith. xiii+208 pp. (Simpkin Marshall.) 5s. net.—This book is the outcome of a course of university extension lectures, and its pages contain much matter that has been scattered through recent critical volumes dealing with our later English poetry, lucidly and popularly put. Though the volume contains little that is original, it nevertheless sums up recent thought in a comprehensive way. Optimism, hope, intellectual doubt, pessimism and revolt, and neo-romanticism are the main tendencies discussed by the author; and he criticises in turn the work of the Brownings, Tennyson, Clough, Arnold, Edward Fitzgerald, Swinburne, Rossetti, and William Morris. Especially interesting is the analysis of the work of Mr. Swinburne, as the poet of the sea, of childhood, and of patriotism. The book will be both welcome and serviceable to those students of the literature of the last century who are feeling their way towards a complete grip of the prevailing philosophies of the period.

The Major Dramas of Sheridan. By G. H. Nettleton. cxvii+331 pp. (Ginn.) 4s.—Here we have a fine edition of "The Rivals," "The School for Scandal," and "The Critic." Mr. Nettleton has gone to Mr. Fraser Rae for his biographical introduction; but so well has his own work been done that this volume is worthy of all attention for its own sake. In the purely critical matter the editor has been careful to study Sheridan's plays in the light of contemporary evidence. He tells us that more than a thousand volumes of eighteenth-century memoirs, diaries, novels, essays, poems, newspapers, and magazines have contributed to this result; and this editorial labour has produced a noteworthy contribution to the literature which deals with Sheridan's work. The aesthetic element in Mr. Nettleton's criticism also deserves commendation; he has taken great pains to resolve Sheridan's work into its constituent elements, and we think he has succeeded admirably; and his method of dealing with the comparison of Goldsmith with Sheridan is worthy of attention. The notes are full and well done. The volume deserves to be widely and appreciatively used.

Mathematics.

Intermediate Hydrostatics. By William Briggs and G. H. Bryan. viii+264 pp. (Clive.) 3s. 6d.—It is somewhat difficult to treat the subject of hydrostatics mathematically without the aid of the calculus; apart altogether from the symbolism, the fundamental idea of a limit is required at a very early stage and cannot be ignored without a sacrifice of clearness. At the same time, a considerable part of the field may be traversed in a fairly satisfactory way if the leading definitions are carefully stated and explained and full use is made of elementary experimental results. No direct appeal to the calculus is required in readers of the book under notice, and the amount of mathematics demanded may fairly be ranked as elementary. Subject to these limitations, the range of topics discussed is very wide; the exposition is generally clear and accurate, and the number and variety of fully worked examples make the book specially useful for those who are studying without the guidance of a teacher.

An Episode of Flatland; or, How a Plane Folk Discovered the Third Dimension. To which is added an Outline of the History of Unæa. By C. H. Hinton. ii+

181 pp. (Sonnenschein.) 3s. 6d.—No one need be deterred from reading this book by the suggestion of mathematics contained in the title, as its connection with that subject is of the slightest. However circumscribed in their physical movements the inhabitants of Flatland may have been, they show a wonderful similarity in their moral and intellectual characteristics to those who live and move and have their being on the surface of our globe, and the society of Unæa has many points of contact with that of modern Europe. The process by which a knowledge of the third dimension was reached is chiefly interesting from the resemblance it bears to the struggles that have transformed the social conditions of our own age. The reader may be quite unable to understand the Unæan mythology, but he may nevertheless derive some intellectual stimulus from a study of the "Episode of Flatland."

Text-book on the Strength of Materials. By S. E. Stocum and E. L. Hancock. xii+314 pp. (Ginn.) 12s. 6d.—Though books on the strength of materials suitable for readers whose knowledge of higher mathematics is only moderate, and whose interests are centred chiefly in the applications of elastic theory, are fairly well represented in engineering literature, their number is not so great as to make a new text-book superfluous. In the book before us, the range of the subjects treated, especially in part ii., which deals with the physical properties of materials, is wider than in most, if not all, of the text-books in common use; and the exposition of the more mathematical portions, as well as of the more directly practical, is of a simplicity that will bring the discussions well within the reach of engineering students who have a fair knowledge of elementary calculus. In the practical sections an effort is made to meet the needs of students whose mathematical knowledge is very small, so that the book may appeal to a fairly wide constituency.

An Elementary Treatise on Differential Equations. By Abraham Cohen. ix+271 pp. (Heath.) 5s.—The subject of differential equations has in recent years assumed dimensions that are often felt by the mathematical student, and more especially by the student of applied mathematics, to be really formidable. At the same time, the types that are of most importance in physical or mechanical applications are comparatively few, so that a book treating of the more frequently occurring types in the spirit of modern methods and of moderate size is of real value to students. These demands are fairly met by the little book before us. The selection of material has been made in view of the general needs of a student of pure and applied mathematics, the ordinary methods of integration are presented in a lucid form and illustrated by numerous examples, and attention is directed to the leading general theorems that depend for their proof on function theory, and, though not proved in the book, are yet stated to act as a guide to the student. Useful references to authorities are frequently given, and the book is furnished with numerous examples for practice, the answers being given at the end. The book will be found to be of real value for all beginners in the subject, and to be probably quite full enough for many students of applied mathematics.

A New Geometry. Part iii. By S. Barnard and J. M. Child. ix+307-408 pp. (Macmillan.) 1s. 6d.—This volume forms the third part of the "New Geometry for Middle Forms," noticed in the September number (p. 357); it contains "the substance of Euclid, books ii., iii., 35-37, and the harder parts of iv., together with additional sections."

Five Thousand Arithmetical Examples and Exercises. Compiled by R. W. K. Edwards. xx+364+ (Answers) 60 pp. (Arnold.) 3s. 6d.—This collection of exercises is stated in the preface to be arranged so as to form, when supplemented with proper oral teaching, a complete course of arithmetic for those who have been through the elementary stages. The papers set in the examinations conducted by the chief examining bodies have been largely drawn upon for examples, and there can be few types of such questions that are omitted. Special importance seems to have been laid on approximations. The book seems to be very suitable for pupils who are preparing for any of the public examinations.

The Beginner's Arithmetic. In two parts complete. vi+200 pp. (Heath.) 1s.—This book is drawn up on lines now generally accepted as suitable for beginners; the concrete and the familiar are in evidence throughout, and the handling and measuring of actual objects form a necessary part of the course. Teachers in search of a book that could profitably be put into the hands of very young pupils would do well to examine this one.

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Science and Technology.

The Complete School Chemistry. By F. M. Oldham. 416 pp. (Methuen.) 4s. 6d.—It is of much advantage to the young student of chemistry if his text-book contain all that is required for his work both in the class-room and in the laboratory. In this volume the author has endeavoured to meet this requirement. It is by no means the first published volume which attempts to do this; and many of its predecessors have not stood the test of time, partly on account of the difficulty involved in "sandwiching" satisfactorily the theoretical instruction and the practical directions. The author has followed the wise course of collecting the experiments at the beginning of each chapter, and presenting the theoretical work in a continuous form in the remainder of the chapter. Elementary chemistry is a subject which does not lend itself readily to any other course. In subject-matter and treatment the volume is eminently successful, and the illustrations are novel, simple, numerous, and well executed. The standard to which the book is written renders it well suited to the requirements of candidates for the London Matriculation and Army Entrance examinations.

Heat Shadows. By W. Jamieson. 30 pp. (Blackie.) 6d.—Many teachers must have found difficulty in devising, for the lecture-room or the laboratory, suitable experiments on the conduction and radiation of heat, and they will find this little book of much assistance. It consists of about fourteen experiments of a comparatively simple character, the chief requirement being a specially prepared paper which is sensitive to heat. As the paper can be used over and over again, the outlay on material is comparatively small. The author has submitted to us several specimens of the paper with the reverse sides coloured in different tints; we find that, on exposing the coloured surfaces to bright sunlight, the different absorptive powers of the colours are clearly evident.

Elementary Electrical Engineering. By J. H. Shaxby. 192 pp. (Blackie.) 3s. net.—This book is written primarily to meet the needs of artisans who are anxious to understand the principles of the electrical machinery which they are handling every day. The author presupposes no knowledge of the theory of magnetism and electricity, and the earlier chapters are devoted to a brief treatment of this preliminary work. The chapters on the technical applications of the science are quite satisfactory to the needs of the students for whom the book is intended, but we consider that the small size of the volume renders it impossible for the preliminary stages of the subject to receive adequate treatment; and a much more detailed study of fundamental principles would tend towards a more intelligent knowledge on the part of the student.

A Second Year's Course in Practical Physics. By J. Sinclair. 148 pp. (Bell.) 1s. 6d.—This consists of a well-selected series of fifty experiments on heat, together with about twenty experiments on solution, crystallisation, &c. Many of the descriptions are followed by a number of further exercises or questions of a practical nature. An additional interest is given to the volume by the insertion of several novel experiments on conduction and radiation, devised by Mr. W. Jamieson, whose little book is noticed on p. 398 of this number. We may take this opportunity to express our appreciation of the fact that authors almost invariably acknowledge the source of novel experiments which are worthy of adaptation; in the present volume we notice one experiment which bears no acknowledgment, and to which this favour might have been granted.

Systematic Practical Organic Chemistry. By G. M. Norman. 98 pp. (Clive.) 1s. 6d.—This book is intended to meet the requirements of the new syllabus of the Board of Education in practical organic chemistry, Stages I. and II. The examiners now require evidence that a candidate has carried out a number of the simpler preparations; and this requirement is well met by the series of preparations described in the later chapters of this volume. A distinctly novel and useful chapter is that dealing with the "Determination of the Class of a Substance."

Nature Round the House. By Patten Wilson. xii+243 pp. (Longmans.) 2s. 6d.—Considerable literary skill is shown in these nature readings for children, and the illustrations, by the author, are altogether delightful. The book contains a few slips: e.g., the spider is referred to as an insect, and bees are said to belong to the family Aphidae.

Pedagogy.

A Brief Course of the History of Education. By P. Monroe. 409 pp. (Macmillan.) 5s.—This is a condensation of a larger book, and it takes us from the education of primitive peoples to that of the Greeks, Romans, Middle Ages, and Renaissance. It then turns to Locke, Rousseau, Herbart, the scientific and the sociological movements, and ends with a chapter on eclecticism. A feature of the book is the delay of the writer to attempt to define education until the last page; he sees that, interesting as the history of the subject is, instruction is a matter of decade, country, and national characteristics: "The appraisement of the values of life must change from generation to generation . . . the formal statement of the elements of character must remain much the same; the

concrete content must vary as life varies." The problem is ever solving, never solved. The book has many illustrations; we could have asked for more, and especially more from the histories of England, France, and Germany. Tarsot's "Les Écoles à travers les Âges" and Carlisle's "Grammar Schools" would have supplied some. The great value of these books is that they show how abiding is the doctrine of Aristotle, Plutarch, Pestalozzi, and how changeable is the world's request made to the schools. Instruction and the theories about its progress vary; education, at any rate until now, has held to the cry expressed in varied words:

"How man may best here live no care too great to explore."

For good or evil, we follow the sweep of the unseen forces; and you must criticise nations rather than school-masters.

The Principles of Intellectual Education. By F. H. Matthews. 138 pp. (Cambridge University Press.)—This book contains chapters on the aim of education, the training of the senses, the humanities, special subjects, and the like. Mr. Matthews is, we take it, an enlightened conservative; for he would make all his work interesting, and yet keep his time-table laden. Nevertheless, he seems to loathe examinations, and he boldly says: "All education has a tendency, if not carefully checked, to kill that spontaneity of outlook and judgment which makes the original minds of the world." For "education" are we to read "instruction"? The book is bright from cover to cover; but it deals with a corner only of the field of education.

Methods in Teaching. By Rosa V. Winterburn. 355 pp. (Macmillan.) 5s.—This is an exposition of the methods used in Stockton, California, and the book is the response to many requests from American teachers. Mrs. Winterburn is the editor of the various monographs. These monographs seem to be held together by a plan; and, indeed, organisation is the most crying need for any community anxious to instruct its children on right lines. Where large classes are necessary, teachers teach small sections only: the rest of the class are working by themselves, i.e., are learning instead of being taught; interest, of course, lies at the root of all; free intercourse between child and teacher is necessary; original thinking, writing, drawing, are encouraged; and, to sum up, common sense is used. It has been maintained before now in this magazine that the guide, headmaster, or leader (call him or her what you will) of every school is the person, and perhaps the only person on the premises, who should be required to know the history, theory, and modern practice in education; very often, in England at least, he is the one person who could pass no examination in such subjects, while his assistants have each his own smattering. We notice that, notwithstanding the money freely spent and the wise enthusiasm of the teachers, the American child leaves school as soon as he can and trusts to the learning of the streets, and that when he does leave he cannot add and multiply. It is a question which we should like to see debated among our best primary-school teachers—whether or not we should prepare wage-earning children better for life by teaching them in classes of six or ten, and by freely allowing parents to remove them at the age of thirteen. No word (except for two pages on drill) is said in the book before us on the care and training of the body, on which, as on a pivot, turns the whole machine.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Matriculation Mechanics.

MAY I be permitted to direct attention to one or two questions set at the June, 1907, matriculation examination in mechanics of the University of London? There are eight questions in all. Of these, six are of the ordinary physical-mathematical order, which would elsewhere be described as theoretical mechanics. Two have some reference to practical matters, and are here selected for criticism. Question 4 reads:

"Explain the terms *kinetic energy* and *work*. A fly-wheel weighing 100 lb. is 7 feet in diameter, and makes 15 revolutions per minute. Assuming the whole of the weight to be concentrated at the circumference, find the kinetic energy in ft.-lbs."

"Can you suggest a method of converting this energy into potential energy?"

The principles involved would have made this an excellent question had the dimensions given been at all approaching what is found in practice. For a wheel 7 feet in diameter, a weight of 800 lb. to 1,500 lb., and a speed of from 90 to 200 revolutions per minute, would be reasonable.

In view of the ignorance of practical matters displayed in the early part of the question, it would be of interest to your engineering readers to learn what would be the examiners' solution to the last part.

Question 6 is an example in statics. An inclined heavy bar is supported in a certain way, and candidates have to find the supporting forces. Whether the bar is supposed to be uniform or otherwise is not stated, and the candidate is needlessly hampered by the fact that the weight of the bar is not given.

Most students who intend to proceed to a degree in engineering would naturally take mechanics at matriculation. Many such, especially evening students, have a considerable knowledge of practical matters before presenting themselves for examination, and are not likely to be favourably impressed by being compelled to answer absurd questions. Such questions are not likely to appear in the intermediate and final examinations in applied and pure mathematics for B.Sc. (engineering). Here the examiners have the co-operation of Dr. Willis, who represents the engineering faculty, thus ensuring that questions of a practical nature will not serve as a source of amusement to practical men.

I venture to submit that the same means which have been adopted by the University in order to procure suitable questions in the higher examinations might with advantage be applied to the matriculation mechanics. The alternative seems to be that examiners who have no practical knowledge should avoid questions of an applied nature.

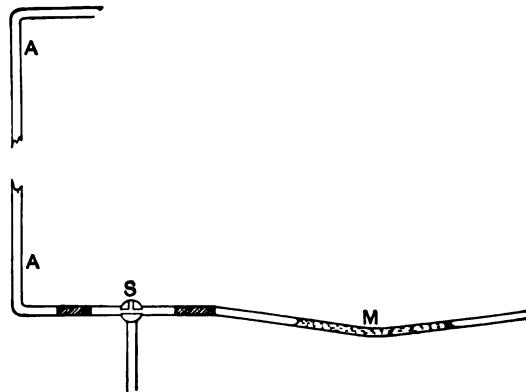
A.M.I.MECH.E.

The Difference of the Densities of Two Gases.

THE method of balancing columns in a U-tube for comparing the densities of two liquids can be applied to the determination of the difference of the densities of two gases. The following description of an apparatus is suitable for finding whether the density of a gas is greater or less than that of air.

A tube, A, of a length as great as the height of the

room will admit, is bent at right angles at a distance of a few centimetres from each end, and is supported in a vertical position. The lower extremity of the tube A is connected up with a three-way tap, S, in such a way that the tube A can be put into communication with either the supply of gas or the sensitive manometer, M. The manometer, M, consists of a tube, with a bore of about 3 millimetres, bent at the centre and supported with the two limbs equally inclined at a small angle to the horizontal. The tube of the manometer is thoroughly cleaned, and a quantity of coloured xylene or water is introduced so as to give a thread of liquid about 12 cm. long. The tube A is put into communication with the manometer, and the position of the thread of liquid is marked by an index. The tube A is filled with the gas and connected to the manometer. The thread of liquid will move to the right or left according as the gas is heavier or lighter than air. If the vertical tube A be 4 metres long, and each limb of the water manometer has a slope of 1 in 20, then the introduction of hydrogen gas



to replace the air in the tube A will cause the thread of liquid to move through a distance of about 5 cm.

The difference of the densities is $\frac{hd}{l}$ grams per c.c., where h cm. is the vertical distance between the menisci of the liquid in the manometer, d grams per c.c. is the density of the liquid, l cm. is the effective vertical height of the column of gas in tube A.

Experiments of this kind were first made by me in January, 1906; and I hope, by using a more sensitive form of manometer, to be able to apply the method to the determination of the density of a vapour.

Canterbury.

F. W. JORDAN.

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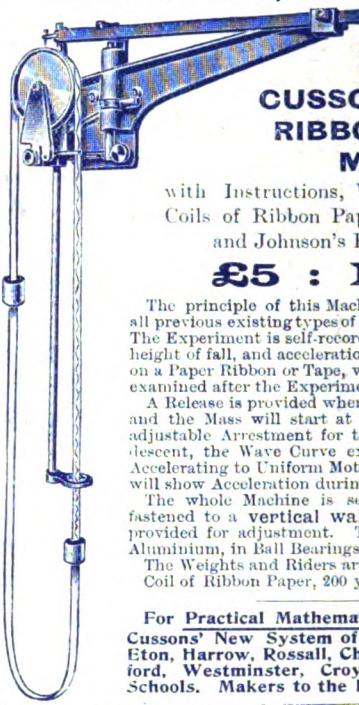
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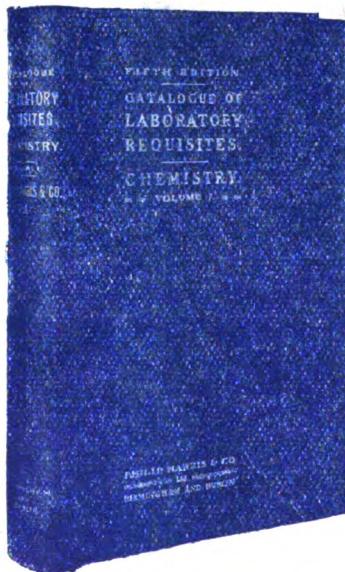
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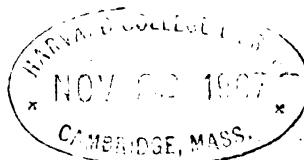
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SIXPENCE.

PRINCIPLE AND METHOD IN THE TEACHING OF ELEMENTARY ALGEBRA.

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ON the subject of teaching algebra much has been written, learned societies have issued reports, and the consensus of opinion appears to be that, to teach the subject effectively, the teacher must "begin at the beginning."

The object of this article is to consider what is "the beginning," to discuss the essential features of a satisfactory course, and to exhibit deficiencies in the usual methods of treatment.

Algebra may be studied as affording a mental training, or with a view to the intelligent application of its principles to practical matters. Unless the subject is so taught that its principles receive that logical development which is appropriate to the mental condition of the pupil, neither of these objects can be attained.

In order to develop a subject logically—

(1) The meaning of every word or phrase which is used in a special sense must be explained: if such explanation is not given in words, it must be possible to infer the exact meaning from the context.

(2) Dogmatic assertions must be avoided, and an appropriate reason must be assigned for every statement made.

(3) Every statement must be true, and if the truth of any statement is subject to limitations, these must be stated.

(4) Reasoning must proceed from the abstract to the concrete.

(5) So far as is consistent with a logical development, the different parts of the subject must be arranged in order of difficulty.

(6) Every difficult point must receive adequate illustration.

In the case of algebra, it may be said that a child, commencing to study the subject, is unable to follow the reasoning necessary to establish the fundamental principles. The reply is that if no reason appropriate to the pupil's mental condition can be found, then either he can derive no advantage from the study, or the teacher should "try again."

The teacher who has made a strenuous effort to
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teach the subject logically, conforming to the conditions stated above, and at the same time to follow the usual course, will probably be convinced that he has attempted what is impossible. In looking for assistance from a text-book he may have found that the author fails to justify important statements which form the basis of subsequent reasoning, that several inaccuracies occur, and that much which is meant to be explanatory is meaningless because words and phrases used in a special sense receive no adequate explanation.

Typical instances of faulty reasoning will be given later in this article. The instances given occur so generally that they appear to form a necessary part of the usual course. If this is the case, the present system of teaching elementary algebra is hopelessly bad, and we are placed in a difficult situation, for—

(1) The author is bound by the examiner, the examiner is bound by the methods of existing books, and this inter-dependence renders a change of system very difficult.

(2) To discover a satisfactory method of treatment, the writer must study standard works on the fundamental properties of numbers. These works are difficult, inaccessible, and many of the most important are in French or German.

(3) When a satisfactory method of treatment has been discovered, the complete rearrangement of the parts of the subject will be a laborious task.

(4) To be successful, the writer must have experience in teaching beginners, and a busy schoolmaster is not likely to have time at his disposal to accomplish the work.

It may be useful here to consider what are the leading points in a logical system; some of these appear to be as follows:

(1) "Algebra is the general theory of those operations with quantity of which the operations of ordinary abstract arithmetic are a particular case."¹

(2) In order that the inverse operations, namely, those of subtraction, division, and finding the root of a number may always be possible, in each of these cases, a new class of numbers is created.²

¹ Chrystal, "Text-book of Algebra," p. 2.

² See Dedekind, "Stetigkeit und irrationale Zahlen."

(3) For every new class of numbers, a set of new definitions relating to equality, inequality, and the operations of addition, subtraction, multiplication, and division must be given.¹

In each case, it will be found possible so to define the new operations, that they are subject to the same fundamental laws as the corresponding operations with natural numbers. This scheme determines the general method of treatment of the subject; we proceed to fill in some necessary details, and to draw various conclusions.

In the first place we note that algebra is part of the science of abstract number. The properties of abstract numbers should be established without reference to concrete magnitudes; this is contrary to the usual method. Instances will be given to show the unsatisfactory character of processes where the reasoning proceeds from the concrete to the abstract.

Next, it is essential that the fundamental operations in the case of the natural numbers should be defined, and the laws which govern these operations investigated. Seeing that these laws depend on the axiom (or law) "Number is independent of the order of counting,"² this statement is the correct starting-point. To go back beyond this is to trespass on the domain of the psychologist and philosopher.³

Continuing with the scheme, the "new" classes of numbers $0, -1, -2, \&c.$, and $\frac{1}{2}, \frac{3}{4}, \&c.$, will be defined, without reference to concrete quantities, as providing values of x which will in all cases satisfy the equations $x+a=b$, $ax=b$. The explanation necessary in each case is extremely simple, and the method may be contrasted with the following attempt to reason from the concrete to the abstract:

Any quantity with the sign + prefixed, or understood, is called a positive quantity, and any quantity with the sign - prefixed is called a negative quantity.

Negative Quantities.—Arithmetically we cannot subtract 6 from 3; i.e., the expression $3-6$ has no arithmetical meaning. In algebra, however, such an expression has an intelligible interpretation. This is best seen by considering a few examples. If a farmer buys 7 cows, and sells 4 cows, he has 3 more than he had at the start. On the other hand, if he buys 4 cows, and sells 7, he has 3 less than at first.

We express this algebraically thus:

$$\begin{aligned} 7 \text{ cows} - 4 \text{ cows} &= +3 \text{ cows} \\ 4 \text{ cows} - 7 \text{ cows} &= -3 \text{ cows}, \end{aligned}$$

&c.

Here, the subject of "cows" is (perhaps wisely) dropped. An opportunity has, however, been given to the "intelligent" youth to put some very awkward questions, as, for instance:

You said that the farmer bought 4 cows and then sold 7. How did he manage this? If he had none to start with (and you do not say that he had

any) I shall be obliged to conclude that he stole some. Did you ever see or count -3 cows? Is " -3 cows" a quantity? Does the minus sign denote subtraction? If so, what are the 3 cows to be taken from? If the + and - in your answers do not denote addition and subtraction, then I suppose that $+3$ cows is a positive quantity and -3 cows is a negative quantity, so that + and - denote opposite qualities of some kind. What kind of property is possessed by a negative cow? What is the average price of one?

Reverting to the scheme, we see that the operation of adding a negative number must be defined. The necessity for this will appear if we consider the method adopted in the following extract:

$8+(13-5)$ means that to 8 we are to add the excess of 13 over 5; now if we add 13 to 8 we have added 5 too much, and must therefore take 5 from the result.

Thus $8+(13-5)=8+13-5=16$. Similarly, $a+(b-c)$ means that to a we are to add b , diminished by c .

$$\text{Thus } a+(b-c)=a+b-c.$$

The "intelligent" youth puts questions: What does the word "similarly" mean? May I give to a, b, c any values I please; for instance, may I put $a=3, b=3$, and $c=5$? If so, I am to conclude that just as $8+(13-5)=16$, in the same way $3+(-2)=1$. Is the following definition of the expression $3+2$ correct? $3+2$ denotes the last number used in the following process of counting: Start with the number 3 on the natural scale, and count two more (4, 5). Can you give any definition of addition which is not equivalent to this? To find the value of $3+(-2)$, I must therefore start with the number 3 on the scale, and count (-2) numbers forward. How am I to count (-2) numbers? I could not count (-2) cows. Perhaps you mean I am to count two symbols back, but I only know one definition of addition, and this tells me to count forwards.

It will now be obvious that $3+(-2)$ cannot be found by counting. Neither can it be found geometrically (for this method means that units of length or area are to be counted), nor by reference to any concrete magnitude, unless some assumption is made which is foreign to ideas connected with abstract number.

The nature of such an assumption will be evident from the following illustration:

If a gain of £3 is denoted by $+3$, then a loss of £2 is denoted by -2 . It seems reasonable to denote a gain of £3 taken with a loss of £2 by $3+(-2)$. If we agree to do this, then $3+(-2)$ means the result of subtracting 2 from 3, and we conclude that $3+(-2)$ ought to mean $3-2$.

This example exhibits the method often employed to prove that $3+(-2)=3-2$. The words in italics are omitted, the assumptions are glossed over, and our notions with regard to pounds, shillings, and pence are used to prove a property of abstract number which, logically, is incapable of proof.

Here is the correct method: the expression $3+(-2)$ is defined to mean the same as $(-2)+3$, in order that the equality $a+b=b+a$ may hold

¹ See "Encyclopédie des Sciences mathématiques."

² Clifford, "The Common Sense of the Exact Sciences." Referring to this axiom, the "Encyclopédie des Sciences mathématiques" says, "L. Kronecker et H. von Helmholtz ont prétendu le démontrer."

³ Dr. E. W. Hobson, in his "Theory of Functions of a Real Variable," says, "Mathematical science, as any other special science, must take its fundamental notions as data."

good for all numbers, whether positive, zero, or negative.

[Observe that $(-2)+3$ can be found by counting 3 places forward from -2 on the scale

$$\dots -2, -1, 0, 1, 2, 3 \dots]$$

Even Prof. Chrystal (to whom the present writer, in common with most teachers of algebra, is vastly indebted) does not deal satisfactorily with the addition of a negative number. In his "Text-book of Algebra" (1886), p. 5, he proposes to prove that $a + (b - c) = a + b - c$ without the limitation $b > c$; he says that it follows from the associative law for addition that

$$+a + (+b - c) + c = +a + \{ +(+b - c) + c \}.$$

He does not remark on the fact that when $b < c$, he is applying a law, which has been investigated only for one class of numbers, to numbers of a totally different class. To justify this, a new operation must be defined.

The operation of multiplying by a negative number and by zero will be defined in such a way that the equality

$$(a - b)(x - y) = ax - bx - ay + by$$

may hold good for all values of a, b, x, y , whether positive, zero, or negative.

The value of $\frac{a}{b} \times \frac{x}{y}$ is defined as $\frac{ax}{by}$. It remains to be shown that with these definitions, the new operations are subject to the same fundamental laws as operations with natural numbers.

Contrast the simplicity of this method with the artificial character of the following :

To multiply one number by a second is to do to the first what is done to unity to obtain the second. To multiply $\frac{a}{b}$ by $\frac{x}{y}$, we must do to $\frac{a}{b}$ what is done to unity to obtain $\frac{x}{y}$.

The "intelligent" youth speaks : I can obtain $\frac{3}{4}$ from 1 by subtracting $\frac{1}{4}$ from 1 : apparently then, to multiply $\frac{3}{4}$ by $\frac{3}{4}$ I must subtract $\frac{1}{4}$ from $\frac{5}{4}$, for this is what I did to 1 in order to obtain $\frac{3}{4}$. Thus $\frac{5}{4} \times \frac{3}{4}$ is the same as $\frac{5}{4} - \frac{1}{4}$.

The only conclusion is that a definition so incorrectly expressed should never find a place in a mathematical treatise.

The scheme will be most incomplete unless we state that every principle, as soon as it is established, is to receive apt and varied illustration by application to concrete magnitudes. Such illustrations must be preceded by an explanation of the use of number as a "measure"; further explanation will be required for each new class of numbers.

Finally, the scheme detailed above leads to a perfectly arranged series of exercises. It will be found that for every particular case of a fundamental law there is an appropriate set of problems, equations, simplifications, and identities. Thus, the different cases of the fundamental laws act as a series of sieves through which, when the examples are passed, they emerge perfectly graded as to difficulty, but in other respects of endless variety.

The usual treatment of "equations" appears to be very unsatisfactory. A proper introduction

(stated very roughly) to this subject seems to be as follows :

All processes in algebra depend on—

(1) The laws which govern the fundamental operations;

(2) Various theorems called Rules for equality and inequality.

Rules for equality are as follows : (i) If $a = b$, then $b = a$. (ii) If $a = b$ and $b = c$, then $a = c$. (iii) If $a = b$, then $a + x = b + x$, &c.

The converse of each of these theorems is also true.

Ex.—Search for a solution of the equation $2x + 3 = 17$.

We begin by assuming that a value of x exists which satisfies the equation, and that x has this value—thus

$$\begin{aligned} 2x + 3 &= 17 \\ \therefore 2x &= 14 \text{ (Rule for Equalities)} \\ \therefore x &= 7 \text{ (Rule for Equalities).} \end{aligned}$$

Hence, if a solution exists, then 7 is the solution.

Again, every step in the above process is reversible. (This follows from the fact that the converse of each of the "Rules for Equalities" is true.) Thus the steps can be taken in the reverse order, and 7 is a solution, and is the only solution.

Exactly the same method can be applied to simultaneous equations. The process usually called "solving an equation" is incomplete unless a verification is added in each particular case, or unless the reversibility of the steps in the process is investigated.

A few more typical instances of faulty reasoning will be added.

We know that $6 \times 4 = 4 \times 6 \dots$ In the same way $xy = yx$ and $xyz = xzy = zxy$.

Now it does not follow that if $yz = zy$, then $xyz = xzy$ (that is, if the order of operations is from left to right). In order to prove this, either the distributive law must be used, or the units of volume in a rectangular block, the edges of which contain x, y, z units of length, must be counted. Again :

The — sign put before a number indicates that we have now to take that number in the reverse direction. . . .

This statement is unintelligible. What operation is indicated by taking a number? When a number has been taken, what has direction to do with it? In this case, reference had just been made to a number of steps, and the omission of the words "of steps" renders the statement meaningless. This is a good illustration of the confusion which arises from an attempt to reason from the concrete to the abstract.

When we come to $+4 \times -3$, we find that $+4$ taken -3 times has no meaning. We have already seen that $-(+4)$ means the reverse of $+4$ or -4 . Thus $-(+4)$ may be regarded as $+4$ taken once reversed.

Here an attempt to reason from the concrete (number of steps) to the abstract (number) leads to further difficulties, for in an attempt to explain that $4 \times (-3) = -12$ we are told that

$+4 \times -3$ will mean $+4$ taken 3 times reversed.

If it is hard to understand the meaning of (the number) 4 taken once reversed, it is three times harder to gather the sense of "4 taken 3 times reversed." Presumably the writer had in mind the taking of steps.

Now to take 4 forward steps reversed is an awkward expression; if we assume that it means to take 4 steps backwards, then 4 forward steps taken twice reversed must mean 4 steps forward.

If any meaning at all can be gathered from the method, it appears to be that

$$4 \times (-3) = -12 \text{ and } 4 \times (-2) = +8.$$

That the usual treatment of "division" is inadequate will appear from the following:

Ex.—Find the quotient and remainder when x^2+2x+3 is divided by $x+1$.

Ans.—Quotient $x+1$; remainder 2.

For all values of x , x^2+2x+3 stands for the same number as $3+2x+x^2$, and $x+1$ for the same number as $1+x$. If $3+2x+x^2$ is divided by $1+x$, the quotient is $3-x$ and the remainder $2x^2$.

To say that the expressions are arranged in descending powers of x in the first case, and in ascending powers of x in the other, does not sufficiently explain the fact that different results are obtained in the two cases.

Recent efforts to add interest to the subject of algebra have led to the abuse of "graphs."

The legitimate use of graphs in algebra appears to be:

(i) As a means of representing the variation of an algebraical function.

(ii) As illustrating various algebraical processes.

An abuse of graphs lies in:

(i) Time wasted (so far as the study of mathematics is concerned) over purely mechanical processes.

(ii) Attempting to prove algebraical results by means of graphs until it has been established that the position of every point on a locus can be represented by number.

CHEMISTRY AS A SCHOOL SUBJECT.

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AMONG a certain section of teachers, instruction in general elementary science which shall include both physics and chemistry has long been advocated for schools. Whilst fully endorsing this view, I am also strongly of opinion that where a boy is destined for a scientific career, systematic chemistry teaching should be postponed until a foundation in the simpler branches of mechanics and physics has been laid. The following observations have been put together from my experience as an examiner rather than as a teacher.

Science may be regarded as a means or as a branch of education; in other words, as a study

or as a discipline, and chemistry is generally held to embrace both. It is supposed to cultivate the powers of observation and to sharpen the reasoning faculties, as well as to impart useful knowledge. Yet there is no other science, except, perhaps, electricity, so full of mysteries, paradoxes, and perplexities.

Let us examine some of these. At a very early stage the study of the invisible is begun, i.e., the study of gases, their preparation, and their properties. Let us suppose that the boy begins with a piece of marble or chalk, and finds that it loses weight on heating. He concludes naturally and rightly that something invisible has escaped, and finds that whereas the substance effervesced with acids before heating it does so no longer. The invisible thing, or gas, he correctly surmises, comes from the chalk, and in some mysterious way the acid removes it.

When he begins to experiment with zinc in the same kind of way, which he will presently do, he finds that his previous knowledge, instead of assisting him, misleads him. The zinc gains in weight on heating, and, on treatment with acid, the gas (so he is told, for he does not discover it for himself) comes, not from the solid, as he would naturally have suspected, but from the acid solution.

This is a fair sample of the kind of paradox with which the beginner in chemistry is usually confronted. The discovery of such pitfalls might stimulate the powers of observation, if they could always be brought into play, but no power of observation enables the student to discover, in the experiment just named, that the hydrogen comes from the acid rather than from the zinc. At this early stage he begins to rely on the statement of his teacher. How many boys could give a proof that the hydrogen came from the acid? They might say that zinc, being an element, could not contain hydrogen, but the elementary nature of the metal would still rest on the authority of the teacher.

Take another case. A boy studies the preparation of oxygen from mercuric oxide. Does his previous information help him? Not a bit. If he weighed his red substance before and after heating, which, on account of certain practical difficulties, he usually omits, he would find that, like chalk, it loses weight, but, unlike chalk, it changes colour and becomes metallic. The process is the reverse of what happened with zinc. A boy of acute intelligence would connect the phenomena, and conclude that what the zinc gained in the process of renouncing its metallic properties, the red substance lost. But he has not finished with the problem, for he is shortly told, or possibly discovers, that mercury is transformed into the red substance on heating. Here is another bewildering paradox. A substance can undergo two opposite changes when submitted to the same process.

The above are not out-of-the-way examples, but are chosen from those which a beginner is set to perform. Nor are the perplexities, which I have

endeavoured to set forth, imaginary. We have only to look into the history of chemistry to be convinced of their reality, for we find that it took centuries before the exact nature of the phenomena manifested by these three simple experiments was correctly interpreted.

Passing by the curious contact phenomenon connected with the preparation of oxygen from potassium chlorate and manganese dioxide, which comes into every school programme, let us consider the way in which the schoolboy is made to study the composition of water.

If he were allowed to remain satisfied with the discovery that, when oxygen and hydrogen unite, water is formed, little objection could be taken to the information acquired or the experimental evidence on which it rested. He would burn hydrogen in oxygen, and oxygen in hydrogen, he would pass hydrogen over an oxide, and explode the gases by an electric spark, and find that water was formed in each case. The proof is sufficiently clear and convincing. But as a corollary, he is usually made to learn the composition of water by weight and volume. He is shown that by electrolysing water two volumes of hydrogen and one volume of oxygen are evolved at the ends of two pieces of platinum wire. Let us consider this process for a moment. The boy is introduced to a new and mysterious agency, the electric current. His only previous experience of it, in connection with chemistry, is probably in effecting the union of hydrogen and oxygen. He now finds that in another form it can produce the opposite result equally well. When he comes to hydrochloric acid he learns the same thing, namely, that electricity in one form or another can induce either the formation or the decomposition of the same substance.

Henceforth the electric current becomes what the Gulf Stream is in geography, a potent agent for effecting anything which the boy is incidentally called upon to explain. The passing of a spark through a solution, or of a current through mixed gases, does not trouble him; for his purpose the two are synonymous. There is no compound gas that I can recall that has not been described, at one time or another, as either being formed or decomposed by electricity. Ammonia, oxides of nitrogen, hydrogen sulphide, hydrocarbons, &c., have all been decomposed or combined. How simple it is to determine composition by volume by the aid of so handy an agent! The gas separates into the required number of volumes of its components, or the required number of volumes are united by spark or current, and there is nothing more to be said! This is all paper chemistry. Reason and observation have nothing to do with it. Why should water be converted by the invisible thing called a current into the exact number of volumes of the two gases of which it is composed, and why should they separate at the ends of two different platinum wires? The schoolboy never really finds out, and, indeed, he only reaches the final explanation when he learns, at a much later date, that the current

does not decompose the water at all. The process is mysterious, the explanation (if one is given) is unconvincing, and its effect is mischievous.

Confront a boy with an unusual phenomenon, and offer him an explanation which does not appeal to his reason, and unconsciously he ceases to exercise it. His critical faculty becomes gradually blunted. Could anything be worse as a discipline! Let us see the sort of result that follows. He is told that the composition of hydrogen chloride is deduced from the electrolysis of its solution in water. Now, although the boy has already been shown that hydrogen is formed by electrolysing water, he does not hesitate to accept the statement that the hydrogen is derived from the acid and not from the water. I have never come across any boy who has questioned this information, and who was not content to accept assumptions which his undisciplined common sense would never have sanctioned. Surely a process which leads to a result of this kind must be intellectually demoralising.

But suppose that we suppress electrical phenomena of all kinds at this stage, as some sensible teachers do, and only rely on the union of gases to prove their composition by volume, we are by no means at the end of our difficulties in studying volume relations.

The boy finds that two volumes of hydrogen and one volume of oxygen do not give three volumes of the combined gases, but undergo contraction in the process to two volumes. Here is a natural paradox more remarkable than any of those which have come within his previous experience. Could he have anticipated such a thing? One remembers how astonished such an old experimenter as Priestley was on mixing oxygen and nitric oxide, and noticing the one gas, as he described it, "eating up" the other. Why should three volumes become two? The same thing happens when carbon monoxide and oxygen unite. But if hydrogen and chlorine combine, or carbon burns in oxygen, no change ensues. This must be very perplexing to the average boy. The contraction is, in fact, so remarkable, so opposed to common sense and common logic, that the process cannot appeal to his reasoning faculty. He remembers it as he would a conjuring trick, and mentally subjects every union of gases, mixed or combined, to the same process of contraction. I have seen the atmosphere described as a mixture of four volumes of nitrogen and one volume of oxygen which together form one volume of air. The teacher may say "This is all straightened out subsequently, when the boy learns about atoms and molecules." My opinion is that with atoms and molecules his real troubles begin. He steps out of the domain of the tangible, and flounders among the imaginary. It is "confusion worse confounded." To my mind there is nothing in the whole region of science so difficult to make clear as the meaning of atomic and molecular weights. You may explain combining

weights and equivalents, or, better still, let the boy find them out for himself. That is another matter. Atoms and molecules live apart. They belong to the region of the invisible and the transcendental. The reason for this is that our knowledge of them rests mainly upon our knowledge of the gases, and the gases, from the boy's point of view, lie on the brink of the unreal.

I do not propose to enlarge upon this topic, but I am quite convinced that the habitual use of formulæ and equations by those who do not properly grasp their significance is positively harmful. It would not matter if the formulæ were used merely as a kind of shorthand, but, far from this being the case, they are taken to imply definite knowledge. How many boys can give a complete and logical reason for writing nitric acid HNO_3 or sulphuric acid H_2SO_4 ? Very few. But there are many who would tell you without hesitation that the one acid contains nitrogen and the other sulphur, by referring you to the formulæ—in other words, the theory is used as the basis of the fact, instead of the other way about, and a condition of topsyturvydom reigns, such as Alice experienced in passing through the looking-glass.

I know of a school where the first notions of science are imparted by the study of the gas-flame and the Bunsen burner. The child has no previous knowledge of gases. Before it has been taught to regard gases as something real and tangible, it is brought face to face with one of the most elusive of chemical phenomena, namely, that of flame. The facts which the child learns seem to heighten rather than to simplify its difficulties, and its first ideas of science are consequently confused. Chemistry becomes a thing of pretty surprises, unexpected odours, bewildering messes, or disconcerting sounds.

A subject such as flame, common though it is, cannot be handled by a beginner. It is like setting a series of riders in Euclid to one who had never learnt the propositions. It is a mistake to suppose that common phenomena should be studied early because they are common. Some of the commonest are the most involved.

In these somewhat discursive observations I have attempted to point out the dangers attending the teaching of chemistry as a school subject. It is not that the teaching is too didactic, nor, on the other hand, that the beginner is left too much to puzzle things out for himself. It is simply that the subject does not admit of simple and logical treatment. I do not propose to lay down a scheme of instruction. There are a certain number of chemical facts that can be taught to young people without perplexing them, and which convey really useful information. But it is, I feel sure, a mistake to imagine that chemistry is a sound discipline. The principles of mechanics, hydrostatics, pneumatics, light, sound and heat are far more valuable as a foundation for building up a scientific habit of thought. Chemistry, as a science, should be relegated to the college and the university.

RELIEF MAPS AND MODELS.

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OF late years the usefulness of relief models for the teaching of geography has been admitted on all hands. Excellent relief maps of certain countries are to be had at a moderate price, but relief models are obtainable of a very few districts only. Moreover, the model which should be the first to find a place in the class-room or the geographical laboratory is the model of the home locality. This, of course, is not often on the market, and to have it specially made by the trade would be far too costly, considering the small sum usually available for geographical apparatus. Some months ago I determined, as a way out of the difficulty, to try whether relief models could not be made by the pupils themselves, and I have here set down an account of our experiences which may not be without interest to the readers of THE SCHOOL WORLD.

The first attempt was a model of Flintshire. We used the cheap copies supplied by the Ordnance Survey Department of Sheet No. 107, scale 1 in. to the mile, printed with contours and no hachures. We decided to use the step or layer system, the method of which consists in cutting out sheets of cardboard with boundaries the exact shape of each contour line. These sheets are placed in their proper places one over the other, and the result is a model which, instead of showing gradual slopes, has abrupt rises at the contour lines. This, of course, is not a true representation of the hill slopes, but with a good light full on the model (*i.e.*, not a side light) the steps almost disappear, and an excellent modelled effect is produced. Moreover, *this is the only method* by which it is possible to have the actual map with all its detail on the model. This in a local model is excellent, because the situation of any village with regard to the surrounding features can be studied as it appears (*a*) actually, (*b*) on the flat map, (*c*) on the model. More important still, it is by far the easiest and soundest method of familiarising the pupil with the meaning and reading of contour lines.

If gradual slopes are preferred, and if the full detail of the map is to be dispensed with, the steps may be filled in with plasticine, papier-mâché, or other similar material. This was the method used in making the geological model of the Isle of Purbeck, which is to be seen at the Jermyn Street Museum of Practical Geology.

Having decided on the method, we took five or six of the cheap Ordnance maps and mounted them on cardboard about $\frac{1}{2}$ in. thick. Throughout the model, thin glue was used; paste, seccotine, fish glue, and the like are to be avoided, as they take too long to dry, and the moisture is apt to make the cardboard buckle. The above thickness of cardboard gives approximately a vertical scale three times the horizontal. This

ratio should be greater for smaller scale maps and smaller for larger scale ones. (I am aware that the question of scales is a very debatable one, and as so much depends on the type of country, the purpose for which the model is intended, and other matters, I fear that an authoritative pronouncement will not be arrived at.) Two or three boys were chosen who were known to be fairly expert with tools and especially with the fret-saw. The fact that all the boys in the school had received instruction in manual training was in our favour; the workshop was chosen as the theatre of operations, and the manual instructor's valuable advice and supervision were called in. I may here say that at first we hardly thought all this was necessary, but we found as we went along that we had embarked on a more ambitious enterprise than we had imagined.

Theoretically, two mounted maps only are necessary, and are used as follows. One map is cut with a fret-saw through the 200, 400, 600, and all the even hundred contour lines, and the other through the 100, 300, 500, and all

cut slices instead of rings, in these places, using a few more maps but saving a considerable amount of time and trouble.

This is in short the method. Those who attempt such a model will doubtless vary it according to their appliances and conveniences. I do not believe, however, that the fret-saw can be dispensed with. In order to keep the foregoing description as simple as possible, I have omitted a few points which occurred as we proceeded with the work. To those who really mean to undertake such a model a summary of these will now be useful.

(a) The lowest contour is 50 ft., not 100 ft., and was not mentioned above for fear of confusion. Vary the above instructions as follows:

(i) Make the base of the model by mounting the whole map on the board.

(ii) Make the second layer by cutting a map through the 50-ft. and 200-ft. contour, the cardboard for this being *half the thickness* of the other sheets. It is fairly easy to split a sheet of cardboard.

(b) A saving of time was effected by going along the contours with red ink, keeping the ink line *on the lower side of the higher edge* of each ring so that it is covered up in the model. The contours, especially on the cheap reprints, are not easily distinguished from boundary and other lines. This inking was done by boys who were not using the fret-saw.

(c) Above 1,000 ft. the contours on the inch to a mile maps are drawn at each 250 ft. Steps such as these are too abrupt, and destroy the modelled effect. We tried two methods of overcoming this difficulty.

(i) We made the steps by building up with two and a half sheets of cardboard. We then filled in the step with a pulp of filter paper and paste, which in a few days set perfectly hard. This, however, covered the detail, and although the detail at such heights is comparatively unimportant, yet the uniform appearance of the model was destroyed. The method of the next paragraph gave a much better result.

(ii) We sketched as accurately as possible form lines (sketched contours) at 1,100, 1,200, 1,300 ft., &c., following the general directions of the contours already shown on the map. We then proceeded as in the model below 1,000 ft.

(d) After each layer was glued down to the one below it, it was pressed by a flat board and heavy weights.

(e) When the model was finished, we coloured the principal roads, rivers, railways, and woods.

In this state we fitted it into a box about six inches deep, painted white inside, and with a glazed lid. The delight and pride which we felt in it at the moment of completion have been continually renewed by the commendation which it never fails to receive from all visitors who are interested in such matters. The cost, including cardboard, maps, and box, can hardly have exceeded five shillings. With the shilling Ordnance maps it would come to about ten shillings.

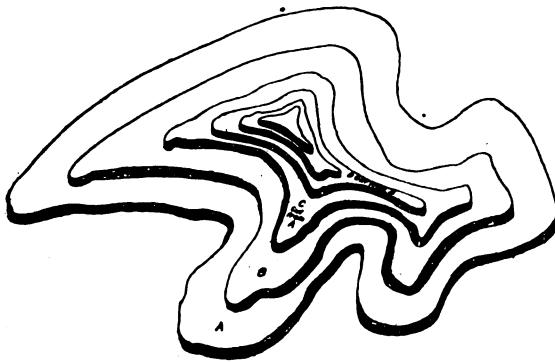


FIG. 1.—Diagram showing a hill built up of rings of cardboard. C is cut from inside A, and D from inside B.

the odd hundred contour lines. This gives rings, or strips, each with a lower border and a higher border differing by 200 ft., one set of odd hundreds and another of even hundreds. The first and lowest ring is from sea-level to 200 ft. On this ring the detail of the map is seen, and of course the 100-ft. contour also. Let us call this the base map. The second ring has edges along the 100-ft. and 300-ft. contour lines, and shows the 200-ft. contour. Glue is spread on the under side of this second ring, which is then quickly and carefully laid on the base map so that its lower edge coincides with the 100-ft. contour visible on the base map.

It will be seen readily from the figure that the higher edge of each ring is covered by the ring above it, but it is equally plain that the time spent in cutting that edge is not wasted, as the lower edge of the ring next but one above it is being cut at the same time.

I said above that in theory two maps were sufficient, but in practice we found that when we came to the steeper parts, where the contours are very close, the rings were so narrow that they lost their shape or broke. To obviate this, we

And here let me say that when we make another of this type we shall certainly use the shilling map. I am not at all sure that the cheap zinc maps are worth even the small amount of money they cost.

As to the time taken, this worked out at about seventy "boy-hours." As only a few boys were employed, we were obliged to depend on their keenness for a good many hours out of school.

The class as a whole was not able to share in the work of this rather elaborate model, but I have with very great advantage made every boy in a class (ages thirteen to fifteen) do for homework simplified models on the lines indicated above. A map with contours such as has been given in the physical geography papers of the University Local examinations, showing a simple drainage system, was chosen. This was graphed on thin card, and two copies given to each boy. The contours were purposely kept

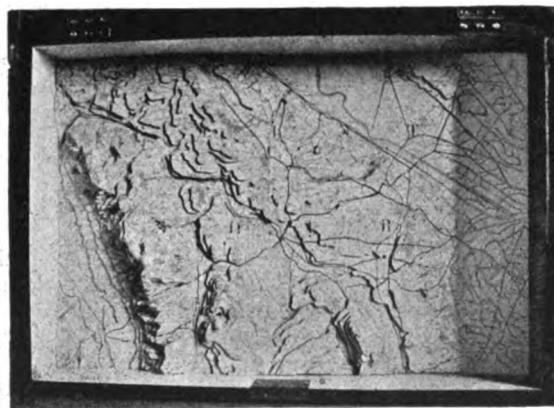


FIG. 2.—Photograph of stepped model. The highest point of the range is 1,820 feet. Owing to the colours, the photo. does not do the model justice.

free from intricacy so that they could be cut with a sharp penknife or scissors. The rings were cut and mounted as above described, and the resulting model shown as homework. After this I have no hesitation in saying that every boy had a clear idea of the meaning of contours, and could read any ordinary contoured map, or sketch any simple natural forms.

An Original Method of Making a Model in Class.—Being dissatisfied, as I have said, because only a few boys were able to participate in the making of this model, I tried to find another method which would not be open to this objection. After much thought and experiment I hit upon what I believe to be an entirely original plan. Instead of using layers, I determined to build up a model as an exercise on sections. The class chosen for the experiment used Bartholomew's half-inch cycling map, each boy having one of his own. The model was to represent a quarter of this map, and the vertical scale chosen was 1 in. to 1,000 ft. The ratio of the vertical to horizontal scale was therefore approximately 10 to 1. I am inclined to think this is rather

large, and we have since tried them half this scale, and it has proved quite satisfactory.

The *modus operandi*, in brief, was to draw sections on cardboard along lines parallel to one side of the map and one-quarter inch apart. These sections were to be cut out and fixed upright in position, the intervals being filled with clay. The advantage over the previous method is that section lines are much simpler lines than contour lines. There is never any undercut or re-entrant curve in the former. They can therefore be easily cut with a penknife, especially as it will be seen that quite thin cardboard may be used.

In detail we proceeded as follows. Lines were allotted to each boy in the class thus: Northern edge, one, two, three, four quarter inches from N. Strips of squared paper of the required length and width, mounted on cardboard, were provided. We have since been able to get cardboard printed in squares. One edge, the base of the section, must be carefully cut along one of the thick lines of the squared paper; the upper edge will, of course, be waste. A line half an inch above this edge was taken as sea-level. Each boy took his



FIG. 3.—To show the section with its clay "plaster" after having been taken out of the grooved board and partly trimmed.

strip, laid the *true* edge on the line allotted and on the north side of it. He then marked and drew the section, measuring the ordinates from the line marked as sea-level. This was checked by his neighbour and returned. He next cut along the section, and also cut off the waste ends. The result was a piece of cardboard as in Fig. 3.

The space below the sea-level line gives rigidity in the low-lying parts of the map. I found that after a little practice every boy could draw and cut out two sections in an hour. It is therefore possible with a class of from twenty-five to thirty to prepare all the sections necessary for a model in one lesson, the class being occupied with really instructive work, and, moreover, work which directly bears upon the examination syllabus of many university and other examining bodies.

A rough box was now made having sides about four inches high and base exactly the dimensions of the map. (The sides must be about one inch higher than the highest point in the sections.) The south side of the box was not fixed until the model was finished.

The next process was to put each section upright in position and to fill in the space with clay. Even if this is done incompletely as shown in Fig. 4, a very clear idea of the lie of the country may be gathered. After several failures we hit upon the following plan: A board was made,

18 in. long, 6 in. wide, having a groove 4 in. wide, and exactly $\frac{1}{4}$ in. deep. In this groove the section was laid down, marked side downwards. Modelling clay worked to a rather stiff consistency was pressed firmly down upon it, and the excess scraped off with a straight edge (Fig. 3). The result was a slab of clay with the cardboard adhering and exactly $\frac{1}{4}$ in. thick. The superfluous clay at the edge of the cardboard was cut off with a knife, and the section was placed in the box in position. Note that the first section, the N-edge, did not receive a clay plaster, but was tacked to the side of the box. If several grooved boards are provided, the slabs can all be placed in position in half an hour. It took us longer, as we only had one board for the experiment.

When this was done the model was correct along the sections and very nearly so between. It was now entrusted to three or four smart boys, each of whom was made responsible for an area. It was left to them to smooth down and fill up

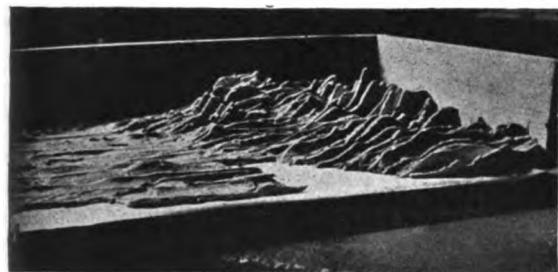


FIG. 4.—Photograph of the first attempt before filling in was complete. The base of the box forms the sea-level. The sections on the plain are too thin to keep their shape. In this model the sections were half an inch apart, not one quarter as in the succeeding ones.

the steps which were the natural consequences of the method. The clay for finishing was worked down to a consistency somewhat smoother than that of the clay used for packing the sections. After the irregularities had disappeared, the boys, by comparing the model with the contour map, were able to model the sides of the valleys and hills. The courses of the streams were carefully picked out, and any marked heights that happened to be between the lines of sections were gauged by means of knitting-needles pushed vertically down into the clay. Thus the clay model was finished, the few picked boys having spent about one hour each upon it. It is quite possible that this estimated time will prove too short at the first attempt, as we certainly acquired a considerable amount of dexterity by our early failures.

It will be observed that we used clay, not plasticine. The boys who have used both prefer clay, finding it cleaner and easier to work. It has, of course, to be kept damp with cloths, and a permanent model is impossible, owing to the shrinkage of the clay. A plaster cast must be taken from the clay model, this being by no means a difficult business, although the necessary splashing of the plaster may be considered by many a

great objection. At some future time I may be allowed to give more information on this point, and also on papier-mâché and other compositions. In the meantime a modeller will make a cast or two from your model for a very small sum, or plasticine may be used instead of clay, thus making a fairly permanent model at first hand. The plaster cast can be painted with water-colours or enamel paints showing such geological or topographical data as are desired.

I have endeavoured throughout this article to show how the construction of models may be educational and a help rather than a hindrance to the teacher of geography. Care must be taken, however, that this model-making does not bulk too largely in the year's work. When one class has spent such time as can be spared for contour lessons, the model may be finished by another class. The whole Bartholomew half-inch map need not be done in one year. So long as the same scale is always used, it is possible to build up quite a large area in a few years, practically the whole work being done in class.

A NEW METHOD OF AWARDING SCHOLARSHIPS.

By CLOUDESLEY BRERETON, M.A.

Divisional Inspector to the London County Council.

THE majority of thoughtful people, whether inside the school or out, are being gradually forced to the conclusion that our academic methods for gauging a boy's abilities have been based on far too narrow foundations. Until quite recently the mere winning of knowledge, or rather of certain very specialised branches of it, has been considered an ample guarantee that its possessor is competent to fill with success the highest and most important positions in the world's work. To put it paradoxically, one might say the writing of Latin and Greek prose is the main test for the Vice-Regency of India. But the real touchstone of education is life, and life, as far as we can judge, awards its scholarships not for knowledge, but for power to utilise knowledge, whether acquired in the school or not. It naturally does not despise knowledge, for the simple reason that the more data a man possesses, the more raw material he possesses for forming sound judgments.

It is true the academic training is not confined to the mere acquisition of knowledge. It fosters, in fact, certain types of ingenuity, but these lose half their value and descend to the rank of elegant accomplishments if they cannot be brought to bear on helping on the world's work. At best they may enable their possessor to solve a difficult chess problem in the weekly column of the *Times*, or win a jingling Limerick. And, finally, the Examining Board of Life gives a very large proportion of its marks to force of character, earnestness, grit, endurance, enterprise, firmness, pertinacity, self-respect, and sense of duty, which the academic pundit either ignores or else roundly declares to be inassessable for examination pur-

poses. To put the thing in a nutshell, our present examinations are too much of an audit in mere knowledge or in restricted forms of ingenuity. They do not sufficiently test the powers of observation or judgment of the candidates, and they entirely fail to take into account what are ultimately vital factors in the candidate's future career. Our time-honoured methods of written examinations are in fact one-sided and incomplete. The necessity of some sort of oral examination, either to supplement or supplant them, is daily becoming more patent.

The Osborne method of choosing naval cadets has been, in spite of certain defects, an undoubted step in the right direction. It allows us to test directly not merely the pupil's powers of observation and inference, but also the moral qualities enumerated above, which are so valuable in the race of life; for it is the man who can do twelve hours a day of intelligent work who wins in the long run, the sturdy stayer who spread-eagles the field of elegant sprinters in elegiacs. Where the Osborne system goes, to my mind, too far in the opposite direction, is in the undue importance it attaches to the oral test, making, as it does, the written work a confirmation of the examiners' decision, but not a corrective; *i.e.*, it weeds out those whom they have appraised too highly, but gives no second chance to those who have been rejected at the preliminary oral. Again, I personally have never been able to ascertain whether the classification adopted by the Board of Examiners is strictly followed by the Admiralty in making its award, *i.e.*, whether all the candidates marked A+ receive appointments before those marked A, and so on, until the list of places to be filled is exhausted. It would be well if some time or other a definite pronouncement could be made on this point by the authorities.

I have recently taken part in an examination for entrance scholarships conducted on lines which are a modification of the Osborne system. The school in question was Clayesmore, near Pangbourne, and my fellow examiners were Lieut.-General Sir Charles Warren, Dr. E. A. Sonnenschein, Professor of Latin and Greek at Birmingham University, and Prof. J. W. Adamson, Professor of Education at King's College, University of London, while the able and energetic headmaster of the school, Mr. Devine, acted as our president. I must confess myself a full believer in the ultimate success of the new system, subject to certain important modifications I have given below; and though I have no authority to pledge the opinions of my colleagues, I am sure, from their spoken and written utterances, they are in the main of the same way of thinking as myself. Thus Sir Charles Warren looks on the oral as most valuable if made an *adjunct* to the school report and written examination; Prof. Sonnenschein regards the interview of candidates as a valuable supplementary means of discovering their capabilities and, above all, their promise; and Prof. Adamson describes

the experiment as "most interesting and valuable." Although the majority of us had had pretty extensive experience in the way of conducting oral examinations, we were all of us making trial of the new system for the first time. I think, therefore, a description of our *modus operandi*, of our experiences, and of our difficulties cannot fail to be of considerable advantage in the way of hints as to what to look for or avoid to any who may be tempted to copy our methods.

The examiners were supplied beforehand by the headmaster with all the official literature on the subject of the Osborne examination, as well as with the printed conditions on the election of scholarships, sent out to headmasters and parents. The boys who presented themselves arrived two or three days before the examiners. They were lodged at the school house, and every effort was made to put them at their ease. The written examinations consisted of papers in Latin, French, English (geography and history), and mathematics (geometry, mathematical paper No. 1, a test of accuracy; paper 2, a test of knowledge). The papers were set and corrected by the school staff. They were very fair papers and very fairly marked, but perhaps on a subsequent occasion it might be an advantage if they were submitted to the external examiners for consideration and criticism, in case there were any points on which the latter thought the papers might be improved.

On the day of the interview each boy wrote a "fifteen minutes' essay" on some easy and familiar subject, such as "my favourite hobby." The result was a series of compositions of about a page or less on riding, boating, stamp-collecting, &c. While the examiners were looking these over, the headmaster read out a short, humorous story to the candidates.

Our first difficulty occurred with the essays. Obviously, length was of little consideration; but how were we to mark them? We came to the conclusion that until we had seen the boys we must proceed in a tentative fashion, ready to revise our results when we had seen enough to form in our own mind a well-defined standard. The system of marking was naturally by letters, and not by figures; the fallacious appearance of certainty given by the latter was thus eliminated. "Very good" was A+, with A and A- as qualifying marks; "good" was B+, with B and B- as qualifying marks; "unsuitable" was C. We tentatively took A- as our top mark, in order to allow us a margin on either side.

Before any of the boys were summoned, a very cursory inspection was made of the marks gained in the literary examination, and the remarks of the examiners dealing with each boy individually. A very valuable aid was the school record of each boy, which was read out by the president before the candidate was called into the room. These reports, as far as we could verify them, were for the most part extremely well and carefully done. There was little, if any, attempt made to exaggerate the merits of any candidate, and the

questions and answers supplied valuable materials for conversation at the interview itself. The following is a copy of the questionnaire itself:

1. Name of boy. 2. How long have you had him under observation? 3. What is your opinion as to his (a) power to observe for himself, (b) power of imagination, (c) power to reason for himself, (d) power of memory, (e) power of attention and application? 4. Has he any particular bent (as, for instance, languages, natural history, or practical mechanics)? 5. Is he keen in his work or play, or in both? 6. What is your opinion as to his (a) general conduct, (b) sense of right and wrong, (c) affection and sense of humour, (d) sense of tidiness, order, (e) will power, (f) bearing, manners? 7. Does he tend to lead other boys? if so, is his influence good? 8. Would you describe him as a boy of average or more or less than average ability? 9. From the point of view of physical power, what do you report as to his general state of health? Would you say he has a strong constitution? Is he a boy of active habits?

(The headmaster would be grateful if you would state confidentially your opinion about this boy, his capacity and the promise he shows, and his conduct both in and out of school since he has been under your care.)

The interview with the examiners lasted twenty to thirty minutes. The proceedings were conducted with all possible informality, and the candidates were apparently speedily put at their ease. The humorous story was of great service in breaking the ice, and care was taken not to put the candidate out of countenance by asking him a series of posers at the outset, but the first preliminary questions were purposely formal or rather informal. The majority of the candidates showed a vivid appreciation of the points in the story, and a few displayed some power of psychological analysis, which, however, one of my colleagues considered to be premature. Questions on hobbies often brought out indications of first-hand observation and powers of inference, as well as evidence of the value of tastes in indicating mechanical or literary bent, or a love of Nature and her ways. Other questions, on the route taken to come to the school, on the home and its surroundings, on places visited, on the daily paper, on the boy's ambition, on sports, &c., brought out further points, such as power of expression and composition, i.e., the power to tell a story in its proper sequence, as well as affording precious indications of various moral qualities, such as the sense of right and wrong, will power, and the capacity for sticking to things.

Personally, I may say that in appraising the marks given to each candidate my decision was almost entirely influenced by these considerations. Only in one case, where a candidate showed a real grasp of oral French, did I also take that qualification into account. I think these were also substantially the lines on which my colleagues worked, as we were all struck with the practical unanimity of opinion at which we arrived as to the relative position of the candidates individually. Speaking again for myself, I will say that I proceeded very largely by impression, putting down a mark for each of the main features

as a kind of memorandum; thus I set down a distinct mark for the essay, for the teacher's opinion, and for the impression I received of the pupil at the oral, copying down also any answer that seemed to be specially indicative of quality or promise, in order to utilise it in talking over the placing afterwards with my colleagues. I did not, however, add these marks together and then strike a mathematical mean, but keeping them as a record or memorandum, I finally formed in my mind a general estimate of the pupil, to which I then attributed the coefficient which seemed best to accord with the totality of my impressions. Whether my colleagues followed exactly the same course I cannot say, but the unanimity of our results arrived at more or less independently was wonderful. We then went carefully into the merits of the candidates' written work, and found that the three best boys on paper were also those whom we had already selected, though the order was not the same. We finally maintained, after discussion, our own order, our principal difficulty consisting in discriminating between the merits of two boys of different ages, twelve and fourteen, but we ultimately arrived at an absolutely unanimous decision. I would add that the final award was strictly in accordance with the placing of the examiners.

I hope the above description is sufficiently full to indicate that the experiment, as conducted by my colleagues and myself, is thoroughly trustworthy and thoroughly workable. It is, no doubt, capable of much improvement. I would suggest that much time would be saved if the preliminary written examination were used as a sieve to eliminate dull and weak candidates. Only boys who obtained a certain minimum of the general total should be allowed to present themselves for the oral. I would widen the written examination by adding a mechanical test, or at least a drawing test, i.e., the making of some simple model in wood, or the sketching of some object from memory; otherwise the talents of certain boys with prominent motor-activities will not be fairly assessed. To the oral I would add a reading test. Its advantages would be twofold. It would be an admirable test in elocution, and incidentally it would be a valuable test in taste and feeling. On the other hand, the explanation of the passage set (not paraphrase or parsing, but analysis of thought) would be a useful help towards assessing the boy's powers.

A mathematical expert should be a member of the examining body, not so much to ask special mathematical questions as to be able by general questions to discover mathematical bent. The time of the interview could be cut down by a third or even a half, if a strict order of questioning were followed, instead of the examiners "cutting in" when they thought fit. The marks should all be shown up on one sheet and added together in order to give a bird's-eye view of the candidate's performances in the written work.

The latter seems to me an integral part of the examination. The questions, if properly framed,

should furnish clear evidence that the candidate possesses the indispensable minimum of knowledge in each subject arranged in an organic and coherent form in his mind, and at the same time indicate whether he is likely to train on in any particular branch of knowledge. But when all is said and done, the best devised written examination is really little more than a more or less complete instantaneous photograph of the candidate's mind. Being by nature essentially static, we can only indirectly infer from it sharpness, cleverness, or acquisitiveness, and to still less an extent can we judge of a candidate's tastes, powers of observation, or of perseverance, or of quickness of apprehension. Moreover, as at present constructed, it is somewhat bookish. The overwhelming advantage of the oral examination is that it allows us to test for those very qualities which can only at best be inferred from the written examination. It should only incidentally, except in mental arithmetic and modern languages, be a test in general knowledge. Its real aim and object should be to find out how much of the pupil's acquired knowledge, whether bookish or picked up in the school of life, can be converted into thought-energy, to discover, in fact, its value in terms, not of *mass or volume*, but of *mental dynamics*. If boys can be crammed on these lines, in order to win scholarships, I can only say that I hope that such cramming will go on, on as big a scale throughout the country as possible, because no boy can be prepared in this fashion without concurrently acquiring a large amount of knowledge, and at the same time having kindled in him the desire to acquire more. Any possible danger of accuracy being sacrificed, or of the taste and judgment being trained at the expense of memory, whereby the boy's knowledge might become superficial or discursive, will be kept in check and balanced by the necessity of having to pass in the written work, which, as I have intimated, should be a test of accurate and organised knowledge in certain indispensable subjects.

CLASS-ROOM PHONETICS.¹

By HARDRESS O'GRADY,
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II.

LESSON IV.—THE CONSONANTS. FRICATIVES.

Apparatus required.—Chart of speech organs; Lloyd's diagrams of the positions of the lips, &c., in producing the fricative consonants. Coloured chalks. (*Note*—For the consonants I use only one coloured chalk, differing from those used for the vowels, and underline vibrated sounds with red.)

REVISION.—Revise Lessons I., II., III., by questions. The following exercises may prove useful:

- (1) i...i, u...u, i...i, u...u,
- (2) i...a, i...a, e...a, e...a, æ...a, ɔ...a, o...a, u...a, u...a.

- (3) i...ɛ...a, a...ɛ...i, i...ɛ...a.....
- (4) ə...a, a...ə.....
- (5) ɛ...e, ɔ...o, ɛ...e, ɔ...o and conversely.
- (6) æ...a...ə.....
- (7) i...e, e...i.....

DEFINITION OF VOWELS.—Before proceeding farther, it will be well to sum up the points that characterise the production of a vowel. I have found the following a method that interests the class. I spoke of common factors (or to young children merely of something which a number of persons or things have in common). For instance, I asked them what might be regarded as a common factor of, or thing common to motor-cars, perambulators, railway carriages, watches, wheelbarrows, sewing machines, roller skates. This elicited the answer *wheels*. I then asked for the common factor in the producing of all vowel sounds. They gave me, and I noted, vibration, passage of the air through the mouth, use of tongue and lips. I left the definition at that until the consonants had been dealt with.

FRICATIVES.—(*Note.*—Although w is the sound that comes first in natural order, I begin with f, as being more definite and characteristic of a fricative.) Give the class a set of words like *five fathers fight fiercely for fun*, and ask them what is the sound at the beginning of each word.

Next, get the class to say what parts of the mouth are used in producing this sound. Write up in the cross-lines (see blackboard notes for this lesson) the phonetic symbol f, writing above it the parts of the mouth used.

v. Ask the class whether there is any vibration of the vocal chords in producing this sound. Ask them to make a sound, keeping their lips and teeth in the same position, and in addition making their chords vibrate as the air passes out. This gives v.

Write up v next to f in the same square, and underline it with a different coloured chalk. Tell the class you mean to underline all sounds in which there is vibration.

Write up on the blackboard (see blackboard note) a list of words illustrating the sounds f and v.

E.g., Five variegated villains vanquished forty Frenchmen, vanishing after violent fighting. Ask what difference there is between the feel of the escaping air of f and v respectively. Ask why this is.

w. Go back to the lip-and-lip sounds. Ask what sound there is at the beginning of most words in :

*Weary Willie wails when we work,
While Woggles wags his woolly tail.*

Ask what parts of the mouth are used in making this sound. Write up above the first square (see blackboard note) "Lip and lip." Ask what vowel is nearest to w in the place of its production. When u is given as the answer, ask why these sounds are alike in the method of produc-

¹ The first article appeared in the October, 1907, number.

tion, and in what points they differ. Hang up again the Lloyd diagram of u, then draw quickly on the board the tongue position of w. Practise this sound, and ask whether or not there is vibration in it. Write up the phonetic symbol under Lip and lip, and underline.

w. I do not propose to deal with this sound if it is required to teach it, the most interesting way of arriving at it is to pronounce w and then unvoice it.

θ. Ask the class to place the tip of the tongue lightly under, and almost against, the upper teeth, and then force out the air between the tongue and the upper teeth. Ask for words in which the sound occurs, and stop the class if, and directly, θ is given, asking for the difference between the two sounds.

If θ is not given, obtain it by asking the class to produce θ plus the vibration. Write up in the next square the symbols for these two sounds, underlining the voiced consonant. Obtain the heading of "tongue and teeth" by questions. Give the following exercise, θθ, θθ, θθ; θθ, θθ, θθ, to be done without stopping between the sounds, and on one breath.

Sentence for practice: *Thirty thieves, thoroughly thrashed, thought theft thankless.*

s. *Sixty serpents hissing sent Miss Cicily scuttling.*

Ask how s is produced, and when "tongue and gum" are given, write them down above the next square. Ask which part of the gum, whether fore or after gum. Refer to the chart of the mouth and note on the consonant chart "fore gum."

z. Ask if any one in the class can follow the course already laid down to produce from s a similar sound. When z is given, ask for the difference in production, and write up the symbol, underlining it. The class might be asked to make up a sentence introducing z very often. Practice szszszsz, as with θθ, θθ, θθ.

x. Instruct the class to produce z, then to point the tip of the tongue towards the upper fore gum and force the air out between tongue and gum. This should give without much delay x. Proceed as in the treatment of other fricatives, taking (1) the tongue position, (2) where in the squared diagram it must be placed, (3) whether it is voiced or not; (4) write in the symbol for this sound, underlining it. Sentences may be suggested, and the familiar *Round and round the rugged rock* given.

ʃ. *Ships shun shelving shoals.*

Ask for the first sound in the words of this sentence, and obtain by questions the position of the tongue when producing it. Or, ask the class to pronounce ʃ, and, allowing the breath to continue escaping, gradually to draw the tip of the tongue backward along the gum. Stop them instantly when ʃ is given. Ask any two pupils to draw on the board their idea of the position of the tongue in pronouncing this sound. Ask where the breath passes out, and take all the fricatives learnt hitherto in order to determine the path of the breath. Ask what the division in which ʃ is to be placed shall be called. Give the

word "palate," explaining generally the formation of the mouth from front to back. Ask what part of it is touched by the tongue in pronouncing ʃ. Ask whether it is vibrated or not. Give the symbol, placing it under "tongue and fore palate." Ask for a few words in which this sound occurs. Supposing ships is given, write the word on the blackboard thus: ʃ-ip-s, the symbol in coloured chalk, the rest in white chalk; thus also ʃ-adow, ha-ʃ, cat-ʃ.

ʒ. Ask whether the last sound has a vibrated "brother" (the word is Miss Dale's). Get ʒ produced correctly. Give as an exercise ʒʒ, ʒʒ, ʒʒ, ʒʒ; ʒʒ, ʒʒ, ʒʒ; ʒʒ, ʒʒ; z, ʒ, z, ʒ. Ask for a description of the two front palate sounds. Ask for words illustrating ʒ. Write up ʒ, underlined, in its proper place. Again, such words as *treasure* may be written up thus: trea-ʒ-ure, *cadge* as cad-ʒ.

j. Beginning with w, go through the fricatives already learnt, asking the class how the tongue moves from θθ to ʒʒ. Ask them to keep their tongues at the ʒʒ position, then ridge up very slightly the back of it, moving the whole tongue back a little. Get a clear j, ask for a drawing of it, some words illustrating it, the path of the breath, whether there is or is not vibration, where j is produced, and write up the symbol under "tongue and middle palate," underlining it to show vibration.

h. Finally, ask whether any other sound of the same kind as those already learnt of the consonants can be produced farther back. Give a set of words beginning with h, pronouncing them with and without h, and ask where the difference lies. Lie in wait for anyone who says an "aitch," and ask whether *High Holborn* is correctly pronounced aitch-igh, aitch-olborn. Ask where the sound is produced. Revert to what has been said about the space between the glottal chords. What happens when the air passes out between the chords well opened, then nearly closed, then nearly but not quite fully open. Point out the rubbing of the air against the nearly open chords. Under the heading "glottis" put the symbol h.

LESSON V.

GENERAL REVISION OF THE FRICATIVES.—Put up a set of the Lloyd diagrams of the tongue positions for the fricatives.

A set of these is to be found in Messrs. Scholle and Smith's book on Phonetics (Blackie).

Beneath these put up the Lloyd diagrams of the vowel tongue positions. Ask the class to sound each set, and compare the two. Get by questions and guidance the difference of mouth-closing, the comparatively large cavities in the mouth for the vowels, the great narrowing for the fricatives. Ask what the common factor of the vowels is, what the common factor of the sounds last taught. Do not give the name *fricative* yet.

EXERCISES.—(a) Take the pairs, f, v; θ, θ; s, z; ʃ, ʒ; and pronounce each pair in one breath, alternating between voiced and unvoiced sounds.

(b) Ask for words in which w, f, v, &c., occur.

(c) Write up the symbols for the various frica-

tives and ask what sounds they represent; then give the chalk to one or more members of the class, and dictate sounds.

(d) If desired, the following may be set as homework: Give, with diagram, the position of lips, teeth, tongue in pronouncing w, f, v, &c., together with an explanation of the passage of the breath, and whether vibration takes place or not.

(e) The following doggerel contains all the fricative sounds:

Shameless, five thieves one winter's eve
Steal from a church the chalice, host,
With laughs the holy precincts leave,
When see! A fiery, threatening ghost
Rises athwart their path and sighs
While others wail the yews beneath
And writh before them, till their cries
Send shudders o'er the furze-strewn heath.

BLACKBOARD NOTES.—I am indebted to Messrs. Scholle and Smith for the idea of the gradual classification of consonant sounds and the construction of the chart. I refer interested readers to their book on Phonetics. Whether they, in turn, have borrowed the idea, I cannot say.

After the sound "f" has been given, tell the class that it might be well to arrange the new sounds in some way or other, and recall the fact that the map of the tongue positions worked out with the tongue travelling from the front of the mouth to the back. Say that you will travel from the front speech-organs backwards. Draw on the board first only three lines, as in Fig. 4, and add the other lines as needed.

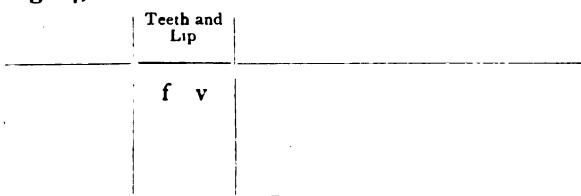


FIG. 4.

When the lesson on the fricatives is finished, the left side of the board will appear as in Fig. 5, the right as given below:

Lip and Lip	Lip and Teeth	Tongue and Teeth	Tongue and Gum	Tongue and Fore Palate	Tongue and Middle Palate	Tongue and Back Palate	Glottis
w	f v	θ ð	s z z̄	ʃ ʒ	j		h

FIG. 5.

- | | |
|-------------------|-----------------|
| w. Whale, woman. | s. Miss, six. |
| f. Fellow, cough. | z. Zebra, gaze. |
| v. Victor. | i. Round. |
| θ. Theology. | ʃ. Shop. |
| ð. Though. | z. Pleasure. |
| | j. Yacht. |
| | h. High. |

LESSON VI.—THE PLOSIVES.

Apparatus required.—Chart of speech organs. Coloured chalks.

Sounds to be taught: p, b, t, d, k, g.

p. Ask what sound comes at the beginning of *Peter Pan*. How is this sound produced? Would you say it belonged to the same class as w, f, v, s, z, &c.? Why not? Does the air pass out continuously, either with free passage or with forced passage? Could you go on producing the sound as an unbroken sound? How would you describe the sound? Do the chords vibrate?

Draw a line under the fricatives. Ask whether p will fit into any of the perpendicular divisions already drawn. Place p under lip and lip sounds. Ask for some words in which the sound occurs. Give as an exercise *Peter Piper picked*, &c.

b. Tell the class to put their lips in the same position as for p, but to vibrate the vocal chords when producing the sound. Write up the symbol for the sound next to p, and underline it to show vibration. Ask for some words in which the sound occurs. Give a series of words, such as cap, cab; pat, bat; prick, brick; cabbage and captain; and ask in which the sound is voiced, and in which unvoiced. Pronounce in one breath p, bp, bp, bp, b.

t. *Tricky trial trips on motor-tricycles with treacherous tyres tired Tom Tiddler till Triscuit entirely restored his training.*

How is t produced? Has it anything in common with p? Is it voiced or not? Can anyone draw a diagram of the tongue position when this sound is produced? Into which square of the chart will t fit? How does the tongue move after this sound is produced? Write up the symbol for t.

d. Is it possible to produce the sound t and at the same time add vibration of the chords? What is the result? Into which square shall we fit it? How shall we show that the sound is vibrated, differing in this way only from t? Give some words, if possible a sentence, in which every word begins with d. Give the following exercise: td, dt, tt, tt, tttt, dddd. What happens to the following words if you unvoice the first consonant: *Dell, die, din, den, dame, dip?* and to the following if you voice the final consonant: *Cat, sat, mat, bat?*

k. Tell the form to produce the sound j, and note the position of the tongue. When some such answer as "middle of the tongue against the middle of the palate" is given, ask whether there is a complete closing of the mouth by the tongue? Ask for a rough diagram on the board of the production of j. Now tell the form to ridge up the tongue so as to get complete closing, at the same time forcing the air to break an opening. After a little trying, the sound k should be given. I have found myself that it is difficult to pass from j to g direct. The voiced j becomes unvoiced k. Place this sound in its square, asking whether it is vibrated, and in what words it

occurs; then ask for the vibrated brother. Write up the symbol, and underline. Exercise by pronouncing k, g, k, g, k, g.

LESSON VII.

Tell the class to listen carefully and compare the various groups of sound you have had. Give a series of vowels, *humming* each one separately, then a series of fricatives, then the plosives.

How do the vowels differ from such sounds as f, v, w, s, ſ? What is the common characteristic of p, b, t, d, k, g? Ask for a good name for f, v, w, &c. (I have found that this gave some little difficulty, until I compared the course of the air in the vowels to water flowing freely through a large pipe, varying in thickness, but always broad, and the f, v, w sounds to the same amount of water turned into a very narrow pipe. I then ask what difference in the sound there would be, to which I generally get the answer that in the small pipe the water would rush or hiss. I ask how this hissing is produced, and get the answer that it is because the water rubs against the sides of the pipe. From this to RUB-SOUNDS, and

TEACHERS' NOTES ON BRITISH HISTORY, 1688-1906.¹

By C. S. FEARNSIDE, M.A. (Oxon.).

IV.—THE REVOLUTIONARY AND NAPOLEONIC AGE, 1783-1815.

THE period we now approach is exceptionally bewildering for several good reasons. First, it includes a very large number of great movements, scattered over a wide area, going on side by side with great rapidity, and with intricate mutual interactions: this makes the history hard to follow at all, and still harder to see clearly. Secondly, these movements are comparatively recent, and are intimately connected with the world in which we live: hence they are hard to judge dispassionately. And, thirdly, just because the period is so interesting in both senses—that is, it is entertaining and it concerns ourselves—it has been more written about than any other period: hence it is the harder to choose one's guide and the necessary correctives to one's chosen guide. The most recent and authoritative account in English is, of course, that contained in the two volumes (vols. viii. and ix.) of the "Cambridge Modern History," which deal with the "French Revolution" and "Napoleon" respectively; and these are indispensable to the serious student. But for school work one needs also some more elementary guidance; and with some diffidence I venture to mention three synoptic books which not only furnish useful summaries and hints on grouping facts, but also give explicit references to accessible books:

(1) C. H. K. MARTEN: *Syllabus of British History*, Part ix., 1760-1815. (Eton College: Spottiswoode and Co., 1s. 6d.) The four parts vi. to ix., 1485-1815, can

thence to the word fricatives is an easy transition.)

Are the p, b, k sounds rub-sounds? Is the flow of air continuous? Why not? What shall we call them? (BURST-SOUNDS is suggested, from which we get to plosives.)

Exercises a, b, c, and d of Lesson V. may be set with such changes as are necessary. The following doggerel contains an assortment of plosives:

Pat bought a brick to deaden Mike,
Mike got a boot old Pat to strike,
Mike appeared deadened by Pat's brick,
The boot caught Pat, though he'd bobbed down. Quick;
Then popped up a bobby and took the trick.

I have found that many boys take considerable interest in making up, *out of school*, sentences or rhymes to illustrate the various sounds. Need I say this is a most valuable exercise?

BLACKBOARD NOTES.—Draw a line under the fricatives before going on to plosives. Place the symbols in colour in their respective squares, underlining the vibrated sounds.

also be had in boards at 6s. net. Good blackboard charts and suggestive, unhackneyed quotations; blank pages for additional notes.

(2) O. H. RICHARDSON: *Syllabus of Continental History*, 476-1870. (Boston and London: Ginn, 3s. 6d.) Useful alternative book references; blank pages for additional notes.

(3) J. S. LINDSEY: *Students' Note-book of European History*, 1789-1815. (Cambridge: Heffer, 2s. net; better interleaved, 3s. net.) Select classified book-lists of European history and numerous synopses, including a graphic war-diagram of the period.

The period finds a very definite ending in the Battle of Waterloo and the Congress of Vienna; but it has no such definite beginning. The meeting of the French States-General, May 5th, 1789, makes an excellent starting-point for France, but it is not until some years later that the new impulses thus focussed and expressed attain European importance. For British and General European history the year 1789 is hardly a date at all. In Britain the great dividing line is 1783, when the younger Pitt takes charge of the Government and begins to pull his country out of the slough into which it has been plunged by the American Revolution; and after that the first divide is reached when his ten years of peace are ended by the outbreak of the Anglo-French War in 1793. So, too, on the Continent, the recent activities of the philosopher-kings and the old jealousies among the Eastern Powers about Poland, Sweden, and Turkey, are the chief matters of moment until, at any rate, the death of Leopold II. in 1792, or even until the final partition of Poland three years later. This latter event coincides roughly with the emergence of Napoleon Bonaparte, whose personality dominates the rest of our period. The next twenty years fall quite naturally and inevitably into divisions based on the phases of the quarrel between Napoleon and Great Britain.

¹ The third article in this series appeared in THE SCHOOL WORLD, June, 1907, pp. 219, 220.

A. British History:(i) **Pitt's Ten Years' Peace, 1783-93.**

(1) **MINISTERIAL POSITION**: King's own choice (compare and contrast Bute and North); importance of General Election of 1784; was Pitt Whig or Tory? Relations with Fox and Burke; Regency Question, 1788-9 (compare 1688).

(2) **HOME MEASURES**: Freer Trade (lower duties; commercial arrangements with Ireland and France); Roman Catholic Relief in England and Ireland; proposals for Parliamentary Reform and Slavery Abolition (Wilberforce).

(3) **INDUSTRIAL REVOLUTION** (agriculture; iron and textile processes; canals; steam) begins to take effect and helps Pitt's recuperative work in finance; Adam Smith.

(4) **COLONIAL AFFAIRS**: Pitt's *India Act*, 1784; Impeachment of Warren Hastings, 1788-95; Botany Bay, 1788; Nootka Sound Affair, 1790; *Canada Act*, 1791.

(5) **FOREIGN AFFAIRS**: Commercial Treaty with Vergennes, 1786; *Triple Alliance*, 1788. Varying attitudes to French Revolution: Burke's "Reflections"; Paine's "Rights of Man."

(ii) **Revolutionary War, 1793-1802.**

(1) **CONDITIONS OF WAR**: Great Britain fails on European mainland (especially Brittany and Netherlands), but wins naval victories (even in the year of mutinies, 1797), and outside Europe acquires territory (temporarily) at expense of France and her European allies (which? where?), and (permanently) at expense of France's Indian allies (which?).

N.B.—Howe, Jervis, Duncan, Nelson, Abercromby, Wellesley.

(2) **HOME CONSEQUENCES OF WAR**: New Tory Party ("Old Whigs"); gagging legislation; social distress; financial pressure; Irish disaffection, culminating in the Ninety-Eight and in the *Union* of 1801.

N.B.—Compare and contrast Scottish Union.

(3) **PEACE OF AMIENS, 1802**: terms; why was peace made then and not earlier?

(v) **The Napoleonic War, 1803-15.**

(1) **REASONS FOR WAR**: Malta v. Germany.

(2) **MINISTERIAL SUCCESSION**: Addington, Pitt, Fox, 1806; then secondary personages.

N.B.—Ministerial crisis of 1807 (compare 1783-4).

(3) **MODES OF NAPOLEON'S ATTACK**: (a) direct invasion (frustrated at Trafalgar, 1805, and at Copenhagen, 1807); (b) Continental System (methods and motives). Hence the Anglo-American war of 1812.

(4) **MODES OF ATTACKING NAPOLEON**: subsidies, sporadic expeditions (Netherlands, Italy, Egypt), Peninsular War (1808-14), Waterloo Campaign (1815).

(5) **RESULTS OF THE GREAT WAR**: heavy financial burden, involving social unrest; great territorial gains, both Colonial and Indian (enumerate).

N.B.—British Map-work (see especially the British historical atlases of Robertson and Reich): turnpike roads and canals constructed in British Isles, 1760-1815; Ireland in 1798; India, 1783-1819 (Hastings, Wellesley); Campaigns in Peninsular War; Waterloo Campaign.

B. Foreign History:(i) **Royal and Anti-Royal Revolutions, 1780-92.**

(1) **CENTRAL EUROPE**. The Emperor Joseph II.'s attempt to exchange the Netherlands for Bavaria is frustrated by the Fürstenbund, headed by Frederick II. (who dies in 1786); and his attempts at internal reform lead to risings in Hungary, Bohemia, and Belgium. His successor, Leopold II. (1790-2), checks Prussia and represses disorder, but fails to preserve peace with France.

N.B.—Tangle of Northern Wars, 1787-91.

(2) **FRENCH REVOLUTION** (to be continually compared and contrasted with British revolutions): American ideas, philosophy, bankruptcy, class grievances, political ideals: Notables (1787), States-General (May, 1789), National Assembly (June, 1789), Legislative Assembly (October, 1791), Convention (September, 1792); Constitution of 1791; Clubs and Mob. Party competitions and threats of foreign intervention lead to foreign wars and abolition of monarchy (1792), and to execution of King (1793).

N.B.—Marie Antoinette, Mirabeau.

(3) **FRANCO-CENTRAL RELATIONS**: *Declaration of Pilnitz* (1791)—ineffective because of Austro-Prussian rivalry—answered by offer of "Liberty to Peoples."

(iv) **First and Second Coalitions, 1793-1801.**

(1) **FIRST COALITION**, 1793-5: Prussia, preoccupied with Second and Third Partitions of Poland, is slack in war against France, makes peace at Basel in 1795, and makes alliance in 1796; Austria, left alone and crushed by Bonaparte's campaign of 1796, makes peace at Campo-Formio, 1797.

N.B.—Circle of Republics round France, 1796-7.

(2) **FAILURE OF DIRECTORY** (1795-9) during Bonaparte's absence in Egypt (reasons for attempt and failure).

(3) **SECOND COALITION**: Austria renews war early in 1799 with help of Russia; at first successful; but Bonaparte's return is followed by establishment of Consulate (18 Brumaire, 1799) and the great victories of Bonaparte and Moreau in 1800, which lead up to peace at Lunéville, 1801.

N.B.—Paul I.'s Armed Neutrality, 1800-1: Alexander I.

(vi) **The Napoleonic Empire, 1804-15.**

(1) **THE FRENCH EMPIRE**: its bases, methods, internal reforms, external expansion; Napoleon's Corsican clan feeling.

(2) **THIRD COALITION**, 1804-7: Austria crushed at Austerlitz, 1805; Prussia (tempering policy) at Jena, 1806; Russia conciliated at Tilsit, 1807. Terms.

N.B.—Dissolution of Roman Empire, 1806.

(3) **NAPOLEON'S SECOND MARRIAGE** follows Austria's defeat in 1809 and, together with Poland and Continental System, leads to invasion of Russia, 1812.

(4) **FOURTH COALITION**, 1813-14: development as regards members, objects, and steadiness. Metternich, Castlereagh, Talleyrand, and the First Abdication of Napoleon, 1814.

(5) **THE HUNDRED DAYS AND THE CONGRESS OF VIENNA**: bases of settlement—gainers and losers?

N.B.—European Map-work (see especially Putzger's "Historischen Schulatlas"): Europe (especially France and Germany) in 1790, 1797, 1802, 1812, 1815; Bonaparte's Campaigns in 1796, 1799, 1805, 1812, 1813, 1814.

REVISED VIEWS IN HISTORY.¹

By A. J. EVANS, M.A.

II.

THE task which was tacitly imposed by the nation on the Tudor family was to save it from a repetition of the Wars of the Roses. That involved the removal of the causes and of the occasion. The causes were "want of governance," and the wealth and warlike tendencies of the nobles. The occasion was the failure of undoubted heirs to the throne. Therefore the central government must be strengthened, what were left of the nobles reduced in wealth and power, and the royal family must increase. The first twelve years of Henry VII.'s reign saw six sessions of Parliament. These recognised Henry as King, and gave statutory sanction to the jurisdiction of the Privy Council, which, under the name of Star Chamber, had been doing work under Edward IV. They made "maintenance" illegal. Later years saw the establishment of other prerogative courts, the Court of Requests, a creation of Wolsey's for cheap and speedy justice, the Council of the North, the Council of the Welsh marches, and the High Commission Court for ecclesiastical matters. All these were popular, because they were directed against local magnates, and protected the poor and needy. So the Tudor "despotism" was slowly established. But could it last? Would the family survive? If there were no male heirs two evils threatened—civil war and absorption into a foreign house, as had been the fate of Burgundy and Brittany in the fifteenth century, two countries with which England had intimate relations. From 1509 until 1537 there was no heir to the throne. Henry VIII. alone stood between his people and, on the one hand, anarchy, on the other, subjection to the house of Valois or Habsburg. This period of painful suspense explains the reign, and accounts for the occasion which brought about the politico-ecclesiastical "reformation." While there were hopes of an heir by Catherine of Aragon, Wolsey might play the diplomat, and think he was the makeweight in Europe, whereas in truth he was but the balance index. Parliament need not meet, for the King was rich, either with the spoils of the nobles left by Henry VII., or with the "loans" and gifts which Henry VIII. could collect from the wealthy. But when the Pope could not or would not pronounce the sentence which would allow Henry to marry someone more likely than Catherine to give the kingdom an heir, Parliament was summoned, and helped the King, so far as statutes were necessary, to cut the connection with Rome, and give to the country a position of "splendid isolation."

It is not until we reach the reign of Henry VIII. that we can get a general view of mediæval Church matters. The work of our first "Long Parliament" (1529-36) was comparatively easy, because it was only the end of a long controversy. The

Synod of Whitby (664) had brought the Churches of the British Isles into conformity with the usages of "Rome," i.e., of Western Europe. Gradually, here as elsewhere, the authority of the Pope had grown, and the English Church formed but a part of the "Catholic" Church. With the growth of a strong kingship under William I., and the realisation by Hildebrand (Pope Gregory VII., 1073-85) and others of the inherent separateness of Church and State, the two organisations stood out one against the other, each claiming to be the guardian and ruler of men. Hence the erection of separate ecclesiastical courts and the growth of the "canon" as distinct from the "common" law. Hence the struggle over investitures (Henry I. and Anselm), over jurisdiction (Henry II. and Becket), over taxation (Edward I. and Winchelsea, 1297). Hence, too, when the Papacy was under the influence of our French enemy, the Statutes of Provisors and Præmunire. All these and many minor points (e.g., the use of the assise of Darrein's Presentment) are but part of a long political contest, which has no connection whatever with theology. It was ended, or at least took quite other forms, when Henry VIII., with Parliamentary sanction, became practically Pope as well as King. Church and State in England henceforth have different relations from anything that had been seen before. Henceforward, too, there is a struggle, lasting over a century, as to the theology, forms of worship, and even later the form of government, of the now independent and isolated English Church. Regarded, therefore, from these points of view, avoidance of anarchy, acquisition of an undoubted heir, and the establishment of a new "papacy" and new theologies, Henry's executions have a reason, if not a justification. Yorkists, unfaithful queens and their adherents, Papalists and Protestants, are the categories under which we may group all the victims of Henry's "wrath."

Henry VII. reigned twenty-four years; Henry VIII., thirty-eight; Elizabeth, forty-five; Edward VI. and Mary between them covered only eleven. Those eleven years are as important as the eleven of Charles I.'s personal government and the eleven of the "Commonwealth." The Tudor despotism failed: the country was governed at first by nobles related to the royal family (Somerset), then by nobles who wanted to be related to the royal family (Dudley), then by a woman who showed by her marriage she was Habsburg, not Tudor, and in 1558 it looked as if England were to be a province of Spain. In the same year it also looked as if Scotland were to be a province of France. Where was the hope of "Great Britain," for which the Tudors had worked? And then a "miracle" happened. Mary Tudor and Francis II. of France died childless. England and Scotland were free again, and fifty years after, "Great Britain" began to be. In religious questions these eleven years saw a rushing into extreme Protestantism, coupled with a completion of the plunder which half disendowed the Church

¹ The first article appeared in the October number of THE SCHOOL WORLD.

and established a new nobility, and then as violent a reaction to "Popery." Both were disliked by moderate Englishmen, and each in turn was hated by the extremists who suffered. No wonder that Elizabeth found it not very difficult to adopt a *via media*.

Such are the views on the Tudor rule and the ecclesiastical revolution of their time that are now generally adopted. There is no assumption that any one theology is right or wrong. There is no opportunity for offending any who are not blind to the possibility of others having something to say for their religious views. Religion is seen to be a moving force, yet it is not the only force. Dynastic and national desires are inextricably mingled. We subscribe neither to Foxe's "Book of Martyrs" nor to the martyrologies on the other side. The people who suffered were not, as a rule, simple souls who wanted only to live a quiet life, according to the truth as they conceived it. They were ecclesiastical statesmen who burnt and were burnt according to the views of their day, as cabinets are raised and ejected in our day by votes of the House of Commons. Hallam is still useful for his facts. But he cannot understand. He wonders at Protestants persecuting, and calls it "the original sin of the reformed Churches"—because in his "gentlemanly" and legal indifference to theologies of all kinds, he cannot understand that until the end of the seventeenth century *everyone*, except a very few, believed it their duty and privilege to enforce the "truth," and regarded "toleration" as the work of the devil. Besides, confining himself strictly to "constitutional" history, he does not see that every "persecuting" statute of Elizabeth was a weapon drawn against what most Englishmen thought was an attack from Rome.

For this period Motley's "Rise of the Dutch Republic" has been the most popular book. Why has no publisher thought it worth while to bring out a cheap edition of the sequel, in which Motley, having learnt his art, becomes more of a true historian? In that sequel is an interesting account of the fight of the Spanish Armada, and of the part the Dutch took in it. Besides this, our naval historians have recently taught us that it was not entirely the work of storms, that the Armada was defeated. English sailors and English ships were better than the Spanish, quite apart from the hopeless moral confusion on board the Spanish fleet.

With the defeat of the Spanish Armada, the English Church and State may be regarded as practically independent and secure. Then began the controversy of the seventeenth century. Should the English Church tend more towards Rome or at least towards Arminianism, or towards Geneva? Should her theology be less or more Protestant? Should her form of worship be ornate or simple? Should her government be episcopal or presbyterian? Or should she split into independent Churches, self-governing, though with friendly relations one to the other, *i.e.*, should she be congregational? Were these matters of divine right and of binding obligation, or were they

merely matters of expediency? Such were the questions that began to be asked even at the beginning of Elizabeth's reign, and that were the cause of conflict and even civil war under the Stuarts. Hallam knows only the names, and seems to imagine they came in merely as disturbing factors in the struggle in which he is interested, between Crown and Commons. He does not realise that it was *only* because the King and Court encouraged Arminianism and appointed Arminians to the bishoprics, and because Arminians therefore exalted the kingly prerogative, and, on the other hand, because the gentry, being mostly Puritan-minded and wishing to oppose the "Romish" tendencies, exalted the assembly in which their wishes could be voiced, viz., the House of Commons, that there came to be any conflict at all between Crown and Parliament.

The question was not merely domestic. It was international, too. When James I. came to the English throne; that part of the Catholic Church which still obeyed Rome had effected a reformation at the Council of Trent, had defined her creed, and, under the lead of the Society of Jesus, was working the Counter-Reformation with much success. Spain had not even made a truce with the revolted Netherlands, and all Germany was simmering with religious conflict, which would have broken into war in 1610 if Henry IV. of France had not died then, and which did break into a Thirty Years' War in 1618. What would James I., who wished to be "of Great Britain," do in this conflict, hesitating as he was between a wish to ally with Spain and a desire to help his Calvinistic son-in-law? How could a Puritan House of Commons grant him money until they knew on which side he would use it? And he could not tell an *English* assembly what Britain's policy was.

Thus, the constitution was strained. The Stuarts tried prerogative ways of raising money, so as to avoid meeting Parliament. The gentry opposed those ways because they wanted Parliament to meet. The judges were the arbiters in these fiscal questions, and, especially after the dismissal of Coke, they feared to oppose the King. And here Hallam is in his element, and we should follow him carefully for his facts and his legal arguments, but remember all the time that there is, behind all these "petty" disputes, an ecclesiastico-political conflict.

It was in the reigns of James I. and Charles I. that Greater Britain began to be. Virginia began in 1607 with Jamestown, aristocratic and episcopal. The Pilgrim Fathers sailed from Holland and England in 1620, and founded Plymouth as a "civil body politic." New England grew up from a Puritan movement fleeing from persecution in England, and consisted of Congregational Churches, an intolerant theocracy. Roger Williams, driven thence, founded Rhode Island on the basis of religious liberty, as did also the Roman Catholic Lord Baltimore in Maryland. All these colonies had an influence on the struggle

in England, an influence which is almost entirely neglected in our text-books.

A word should always be put in on behalf of the Stuart Kings. They inherited traditions of Kings who governed, and whose Parliaments had worked loyally and well with them. They knew that the Parliaments had followed Tudor Kings through the bewildering ecclesiastical and theological revolutions between 1529 and 1559. The Stuarts ruled over a Romanist Ireland, a Puritan Scotland, and an England divided in religious opinions. Which were they to follow? and why should not Englishmen be as docile as they had been? There was, as there always is, a mass of opinion mildly religious, but indifferent to the zeal of either party, and the fall of each extreme was welcomed by the nation, Laud's fall equally with that of "the Saints."

Into the history of the war we need not enter. It should, of course, be studied with maps, and attention paid to the extent of influence of each party at various dates. A few points should be made clear. It was not all the Parliament that remained at Westminster. The loyal part went to Oxford and there claimed to be the Parliament. Oliver Cromwell did not begin to rule England until December, 1653. He was not even General-in-chief until after his Irish campaign. The Scottish authorities were the Church Assembly, much the more important, and the Parliament at Edinburgh. It was these two who made the Solemn League and Covenant with the Westminster Parliament. This document was a treaty, not to be confounded with the National Covenant of 1638. When Bills had passed the two Houses at Westminster during the Civil War, they became Ordinances. There was a Self-Denying Bill that excluded members of Parliament from the army, but it did not pass. The Self-Denying Bill that did pass and become an Ordinance simply caused all members of Parliament who were officers to resign, but said nothing about the future. The Westminster Assembly of Divines was a committee, mostly of clergymen, nearly all Presbyterian-minded, whom the Westminster Parliament consulted on matters of religion. They could only give their advice, and it was not always taken.

It is not worth discussion whether Charles I.'s trial and execution was legal or constitutional. It was an event in the middle of a revolution. Whether it was wise, or morally defensible, &c., may be discussed. When Charles I. was dead, the remnant of the House of Commons ruled at Westminster. They conquered Ireland and Scotland, and they conducted a commercial war with the United Netherlands. In 1653 they were ejected by their General-in-chief. Oliver Cromwell then asked the Congregational Churches in the country to nominate persons who should form a Constituent Assembly, i.e., an assembly to make a constitution for the country, as the framers of Magna Carta, Provisions of Oxford, and Ordinances of 1310 had done. Cromwell and his officers chose from this list and added others, and the assembly has been called the

Little or Barebones Parliament, because one of its prominent members (not the Speaker) was Praise (not Praise-God: no Puritan was ever named by a phrase) Barbon (not Barebones). The meeting of this assembly marked the high tide of revolution; Kingship and the House of Lords having been abolished, these godly men would have disestablished and disendowed the Church and the lawyers. Then Oliver Cromwell stepped in and led the country back to its old constitution.

First, in December, 1653, he and his officers made a constitution, the Instrument of Government, by which the three countries were united and were to be represented in a one-chamber Parliament which was to meet regularly. There was to be a Protector with a Council, and the Established Church, now non-Episcopal, but chaotic, was provided with a short creed and a promise of settlement. Next, in May-June, 1657, Cromwell and his second Parliament between them made a new constitution, the Humble Petition and Advice, by which the Protectorate became hereditary, a House of Lords was added to the House of Commons, a Privy Council was to be nominated by the Protector, and the creed of the Established Church was made a little longer. Then, in September, 1658, Oliver died, and after twenty-one months of confusion, the restoration was completed, so far as it ever went, by the substitution of the Stuart for the Cromwell house, and the restoration of the old creeds, forms of worship and of government to the Established Church. Only the made constitution vanished. "So far as it went." But the events of 1642-60 had changed the nature of things. Kingship was restored, and in the old house, but not the kingship by divine right which the Tudors had possessed and which the Stuarts had proclaimed.

Passive obedience might be preached in Episcopalian pulpits, but Charles II. knew that this obedience had limits in the direction of Rome and prerogative taxation. The Parliament was restored, and even the three Parliaments, for Ireland and Scotland had Home Rule again, but it was a Parliament that had come to stay, and even become annual. The Great Contract which had been muddled in James I.'s time was now practically made, and Charles II. was always in want of money. Clarendon might think he was another Burleigh, but he proved to be a new institution, a detachable Minister, who was "slipped" by the King when he was disliked by the House of Commons. The Privy Council was restored, but it soon became unworkable, and was replaced for practical purposes by what we may by anticipation call a "Cabinet." The only institutions really restored were Episcopacy and the Prayer Book, and, for a time, everyone who did not agree to these was treated as a rebel. Presbyterians and Congregationalists were driven from the livings from which they had but recently driven the Episcopalians, and laws were passed to punish what had always been illegal—worship separate from that of the parish churches.

Charles II.'s reign is a period of great changes,

made quietly. The taxation of the clergy, which had been a burning question in 1297, was settled by a verbal concordat between the Chancellor and the Archbishop. The appropriation of supplies by the House of Commons (a matter far more important than the grant) was made permanent, because Charles did not want the money needed for the war to be seized to pay his private debts. A Civil List was established. A Habeas Corpus Act was passed, not to introduce the use of writs with that name, but to provide penalties against evasion thereof. Attainders became things of the past; even impeachments began to grow rusty, as may be shown by the elaborate arguments about the machinery thereof in Danby's Case. The payment of wages to members of the House of Commons by their constituents, which had been necessary in the early years to induce men to undertake the irksome business, which had been the cause of some unwillingness of boroughs to return members, but which, with the desire, growing from the times of the Tudors, to get for oneself, or for one's political *protégés*, seats in the House, had gradually declined, now came finally to an end. It gave the opportunity for the King to ease his relations with the House by distributing pensions and favours, a method of "influence" which grew steadily until, in the closing years of the eighteenth century, it was partly abolished, because of the increasing indignation felt by the party which at any given time happened to be out of office.

But, above all, the reign of Charles II. is the period of the "Popish Plot," not Oates's imaginary one, but the real intention of the King to restore, if possible, the religion of his mother, himself, his brother, his cousin, Louis XIV. of France, and of Ireland, to supremacy in England and Scotland. Hence his attempts at "toleration," by which orthodox Nonconformists gained fitful relief, and even the "Friends," whom those Nonconformists had so bitterly "persecuted" in their day of power in England, old and new. We need not go over the story. The design failed, at first because Charles was determined "never to go on his travels again," and then because James was willing to do so rather than undertake what was impossible. In 1688 William of Orange invaded the country with the connivance of the "Whigs." James II. became legally dead, his son was assumed to be an impostor, his heir succeeded, Mary, and she would not reign except conjointly with her husband. The revolution was checked. There was no change. A new question had arisen and been solved: Would we have a "Popish" King? An "Exclusion" Bill had been proposed in 1678, and after ten years was passed. A "Whig" was one whose zeal for Protestantism was a little more than his loyalty to the royal house, a "Tory" was one whose Protestant zeal was a little less. The decision cost blood and money. We need do no more than mention Killiecrankie and La Hogue to prove that point. The "Revolution of 1688" was neither "bloodless" nor a "revolution."

CONTINENTAL CONTINUATION SCHOOLS.¹

MISS BARGER'S account of the continuation schools is opportune in the date of its appearance, especially in view of Clause 8 in the Education (Scotland) Bill before the House of Commons last session, a clause which empowers school boards to make bye-laws requiring the attendance at continuation classes until the age of seventeen of young persons "who are not otherwise receiving a suitable education." Her account of these classes is valuable, as showing what sort of education is found to be "suitable" for evening classes in such enlightened centres as Baden, where continuation schools are compulsory both for boys and girls, and in Zürich, where they are voluntary. Miss Barger is not correct in saying (p. 13) that Baden is the only German State where attendance is compulsory for girls. It is compulsory now over the whole of Bavaria, in Württemberg, in Waldeck and Saxe-Meiningen. In other respects the account is not only accurate but eminently readable.

Continuation schools in Baden were first established by the State in 1874; from the first they have been compulsory both for boys and girls. Every child on leaving the elementary school at the age of fourteen, unless it passes to some higher school, has to attend continuation classes for three hours a week, the boys for two years and the girls for one. With us those who most need this further education are just those who do not voluntarily seek it, and the first great advantage of the compulsory system is that they are saved from themselves. The next advantage, very clearly brought out by Miss Barger, is that the continuation school does not have to repeat the work of the elementary school. This presents a striking contrast to the condition of things at home. The third advantage is that employers are forced to allow their young employees to attend, and as the organisation of classes is according to occupation, the hours can be arranged to suit the convenience of employers: e.g., baker apprentices attend in the afternoon, when the rounds for the day are over, and young girls in domestic service have classes in the morning.

The subjects of instruction have direct bearing upon the daily employment of the pupil; Miss Barger shows how this is carried out in country districts and in the trade schools, and incidentally shows how these continuation schools have operated to preserve and develop local industries in large villages and country towns. For girls the course provided is wholly domestic and literary; the State evidently does not favour the idea of training women for commerce. The discipline is freer and more friendly than in the elementary school, as it should be. Miss Barger noted only one case of forcible ejection. One

¹ "Continuation School Work in the Grand Duchy of Baden and in Canton Zürich." By Florence E. Barger. 34 pp. Board of Education: Educational Pamphlets, No. 6.

shudders to think what discipline would be in England if compulsion were introduced and the schools were flooded with unwilling pupils. The experience of Scotland will be more relevant for us than that of Baden, for your German boy is marvellously organisable when compared with his English coeval.

Zürich has tackled the problem on voluntary lines. Yet here, too, all employers of standing make it a condition of apprenticeship that their apprentices attend the continuation classes in work hours, i.e., two mornings and two afternoons a week. This is a great help to regularity of attendance, as any case of absence is at once reported by the school to the employer. The schools, too, are kept in close touch with the industrial and commercial life of the town. Though many Swiss cantons have adopted compulsion, all the Zürich teachers, without exception, are in favour of the voluntary system. The only compulsion they wish to see exercised is in the case of the employer who refuses to allow the necessary time off. Miss Barger speaks highly of the eager and orderly spirit of work which prevails; difficulties of discipline do not seem to occur.

In our own country it is satisfactory to note that if we are not yet ripe for compulsion, we are, at any rate, making progress. The Act of 1902, which put the continuation classes under the same authority as the technical schools, has made it possible to grade and correlate the work done in the evening schools of our big towns. Much time and effort is saved, pupils are entered for courses instead of isolated classes, and the quality of the work is improved. The raising of the standard seemed for the time to check the growth of the classes, but that was inevitable, and the statistics show that it is now past. The great needs now in England are:

(i) To secure that the children join the continuation classes immediately on leaving the day school. Even in places which are most successful in this respect, like Manchester, there are still more than 50 per cent. who join after one year's break or longer.

(ii) To secure the co-operation of employers, and especially smaller employers. Until this is obtained the further development of evening classes may lead to serious intellectual strain at the age of fourteen to sixteen. The time an employé of this age spends in the continuation class should count as part of his day's work.

Dent's Further Exercises in French Grammar. By F. M. S. Bachelor. 91 pp. (Dent.) 1s. 4d.—These exercises are intended for upper forms, and deal with the syntax of the verb, particularly with the use of the moods and tenses. The majority of the exercises contain words in italics to be changed or explained, or both, and a continued piece of prose adapted from a well-known French author, including similar exercises, is introduced here and there. The last two chapters are devoted to the use of prepositions and to the formation of words respectively.

IBIS IN URBEM.

WHEN the melancholy Ovid finished his "Tristia," he prefaced it with the well-known line;

Parve, nec invideo, sine me, liber, ibis in urbem,
and, indeed, to-day the book has come down in showers upon the capital. London is full of series; classics in green and red, two shillings every day from the cheap reader. All our reading has cheapened; and the present decade scoffs at library editions, when it can buy its Ruskin and its Grote, its Darwin and its Sismondi, for a fraction of their old prices. We cannot tell if people read the books: we do not believe that people know and study them: but they buy them, and their dainty bookcases are part of the new simple life.

Before us lie two dozen (no disrespect is intended in thus arithmetically lumping the treasure of the brain) of "Everyman's" books. No need nowadays to say that they come from Mr. J. M. Dent, and that probably they were printed, sewn, pasted, bound, pressed and packed in the Garden City. Each costs a shilling, the sum which we have come to associate with the bound reprint. First comes some Ruskin: "Sesame and Lilies," "The Two Paths," and "The King of the Golden River" form one volume, and Sir Oliver Lodge writes the introduction. "The Elements of Drawing," with a preface by a student of Ruskin, and "Pre-Raphaelitism" and kindred essays follow; Mr. Laurence Binyon introduces the book. Mr. Selwyn Image, an old pupil of the Master's, writes a preface, enthusiastic and discriminating, for "The Seven Lamps." All the old illustrations we have come to know so well are in these volumes. We do not suppose that every man will read Elyot's "Gouverour," edited by Prof. Foster Watson, but many people will dip into it and will be rewarded. It is full of information in its nooks and corners, and is a second Montaigne. We welcome heartily the Spenserian version of the "Aeneid," by Mr. Fairfax-Taylor: it is a companion to Worsley, whatever we may think of the suitability of the stanza: it is in one volume. The second volume is by Mr. Royde, and includes the "Eclogues and Georgics" in blank verse. The translator contributes a preface and a concluding sonnet from that frequent source of admirable work, a bed of sickness.

I pass: but Mantua's reed shall murmur still
And in rapt ears ambrosial music sing.

Mr. W. F. Kirby has boldly translated the "Kalevala" into the Hiawatha metre in two volumes. No popular edition by an Englishman had appeared, though Mr. Nutt, in his "Popular Studies in Mythology," had highly praised this collection of Finnish epic songs; the translation was really needed. Dennis's famous "Cities of Etruria," in two volumes, is edited by Prof. Lindsay. The book has never been really superseded, for the Etruscan is even now a mystery; and, as the editor says, Dennis is al-

ways fresh and interesting. Tytler's "Essay on the Principles of Translation" is as admirable reading as it was when first published, and should go along with Matthew Arnold's famous essay. Does translation belong, like so many other efforts in art, to its own decade or century? It is a pity that this essay has not been revised as far as the Greek type goes: there is scarcely a Greek line quoted which does not bristle with mistakes in printing. An admirable reprint in two volumes is Thierry's "Norman Conquest," so much fuller of sympathy and hate than our primers and our larger books are to-day. The Bible is edited in four volumes, Law and History (two), Prophecy and Poetry (one), and Wisdom Literature. The text is the usual one; the apocryphal books are in their right places, and the rearrangement, though slight, adds to the value of the edition. "Ancient Hebrew Literature" is its title; Mr. Bruce Taylor supplies a brief introduction. It is a pity, we think, that Mr. Dent will not try a Shorter Bible for the use of schools, though we are well aware that as yet no such Bible has been welcomed.

Sismondi's "Italian Republics" and Dean Stanley's "Eastern Church" were both well worth putting within the poor student's reach: both are emphatically reference books. Lockhart's "Life of Burns," with a very brief introduction, is sure to be popular, for the selection of the letters at the close shows the poet on a side not generally known. Of course, other books on Burns have also to be read, if we need a biography of that "wandering voice." John Bright's "Selected Speeches" (one vol.) are taken from Prof. Thorold Rogers's edition. There is a great deal more to be published if every man is to know John Bright's English well; and this reprint might (if copyright allowed) have been made three times as long. "Inquiries into Human Faculty," by Francis Galton, is a slightly abbreviated reprint of the 1883 edition. It will certainly be welcomed, if only for the tardy awakening of interest in the subject of human eugenics, which Mr. Francis Galton has done so much to forward. Quite a small library of books dealing with new phases of old psychological questions might be published. They all are trying to regulate the clock of life.

"The Travels of Mungo Park" is always worth reprinting, for it appeals to the unrestful explorers who still come to our schoolrooms (even though out of place there), and to the missionary spirits, whose number no amount of education or external influences will, in all probability, increase or lessen. The last volume to notice is a revised reprint of Dr. Butler's "Ancient Atlas." It is well and clearly done; but though it sounds ungracious to say so, it is not "Everyman's" Ancient Atlas. Every man needs atlases, and maps of countries; much more does he need dozens of little insets dealing with special periods, wars, lives, and civilisations. Labberton made an

attempt in this direction; but so far no one has had the courage to print a dozen large maps and a hundred small ones. The same remark applies to English history, and more forcibly still to the two great periods of early and later mediæval history. But a shilling is a shilling, and Richard de Bury would, if he could, rise from his tomb to thank the publishers and editors of this library, which is probably but beginning its journey through the world—for as yet only about a million and a half books have been sold.

ENGLISH LITERATURE.

REPRINTS, SELECTIONS, AND A HISTORY.¹

WE will begin with the history (1); for it has some features that distinguish it pleasantly from the ordinary school history of literature, which, like the world, "is too much with us." It is not overburdened with names, dates, and details; it is not in the least a cyclopædia. But it gives a good general account of the development of English literature, and of the great names and books about which every educated Englishman and Englishwoman ought to know something; it also contains many portraits and other illustrations. Though too diffuse to be an ideal class-book, it would be an excellent addition to a school library and prize-list. One commendable feature is the "Literary Map of England," which would have delighted Leigh Hunt, who playfully imagined this very thing in one of his most charming essays.

From the same American publishers, Messrs. Heath, comes a daintily produced edition of that important and interesting Middle English poem, "The Owl and the Nightingale" (2). With its careful and complete introduction, its duplicate text (from the earlier manuscript in the British Museum and the later in the Bodleian), its terse and valuable notes and glossary, Prof. Wells's edition exemplifies all the best qualities of American scholarship.

An old-fashioned title and a somewhat unattra-

(1) "The Making of English Literature." By W. H. Cawshay. x+474 pp. (Heath). 5s.

(2) "The Owl and the Nightingale." Edited by Prof. J. E. Wet (Belles-Lettres Series). lxix+228 pp. (Heath). 3s. 6d. net.

(3) "The Harp of Youth: a Book of Poetry for School and Home." Edited by W. Jenkyn Thomas. 272 pp. (Nelson).

(4) "A Treasury of Verse for School and Home." Selected and arranged by M. G. Edgar. Part i., 128 pp.; part ii., 128 pp. (Harrap). 6d. each part.

(5) "Illustrations of English Literature." (The Carmelite Classics.) "From Wyatt to Webster," by C. L. Thomson. xi+188 pp. "From Herrick to Dryden," by G. B. Sillons. x+175 pp. "From Carlyle to Stevenson," by C. L. Thomson. ix+192 pp. (Horace Marshall). 1s. ad. each volume.

(6) "Stories from the Saga of 'Burnt Njál'." Part i. "The Story of Gunnar." By Beatrice E. Clay. 187 pp. (Horace Marshall).

(7) "The Saga of King Olaf." Selected and edited by Beatrice E. Clay. 63 pp. (Blackie.). 6d.

(8) "Grace Abounding and the Pilgrim's Progress." By John Bunyan. The text edited by Dr. John Brown. viii+432 pp. (Cambridge University Press). 4s. 6d. net.

(9) "Alice's Adventures in Wonderland." By Lewis Carroll. With 42 illustrations by John Tenniel. Miniature edition. 201 pp. (Macmillan). 1s. net.

(10) "Froissart's Chronicles: Border Warfare under Edward III. and Richard II." Blackie's English School Texts, edited by Dr. W. H. D. Rouse. 124 pp. (Blackie.). 6d.

(11) "Matthew Arnold's Sohrab and Rustum." Edited, with an Introduction and Notes, by J. H. Castleman. xvii+40 pp. (Heath). 6d.

tive binding may injure the success of Mr. Jenkyn Thomas's book of poetry (3). If so, it will be a misfortune. For the selection is made with taste and judgment; and though its editor expressly, and quite properly, defends the inclusion of "hackneyed" pieces in a book for school use, there is a fair proportion of unhackneyed matter, and all of it very good. It was a happy idea to insert illustrations after famous pictures: G. F. Watts's "Happy Warrior" and "Sir Galahad" are specially welcome.

Another school poetry-book is "A Treasury of Verse for School and Home," by M. G. Edgar (4), to be completed in five parts. The first two parts are before us, and in each the publishers offer a wonderful sixpennyworth—128 pages of large, clear type in a most attractive cover. The selection contains rather too many poems of the magazine level, as distinguished from the eternal favourites, but there is nothing that falls below a respectable standard.

The volumes of "Illustrations of English Literature" in "The Carmelite Classics" (5) might almost be described as Ward's English Poets and Craik's Prose-Writers rolled into one for the use of the beginner. But the selection is an independent one, and the needs and capacities of pupils between fourteen and eighteen years of age have been kept in view. Of the three volumes before us, the two for which Miss C. L. Thomson is responsible seem to come as near to perfection as is possible. The poetry is chosen with an unerring instinct for the best; and the prose pieces are all long enough to possess a certain completeness. Miss Sellon has been less successful in avoiding "scrappiness."

A delightful reading-book for small boys and girls is "The Story of Gunnar" (6), adapted from Sir G. Dasent's translation of the Saga of "Burnt Njál" by Miss Beatrice Clay, headmistress of the Queen's School, Chester. Miss Clay has also edited a most welcome selection from "The Saga of King Olaf" (7), in Longfellow's "Tales of a Wayside Inn." The introductions to these two books are models of writing that is at once scholarly and simple.

The latest addition to the Cambridge English Classics is Bunyan's "Grace Abounding" and "Pilgrim's Progress" (8), textually edited by the Rev. Dr. John Brown. The textual editing has been done with the care characteristic of this valuable series.

A reprint sure of a hearty welcome is the miniature edition of "Alice's Adventures in Wonderland" (9), which gives us for a shilling an unabridged "Alice" in large type and with the original illustrations, in a volume of the size of the "Golden Treasury" series.

Dr. Rouse has added a selection from Berners' translation of "Froissart's Chronicles" (10)—the parts relating to border warfare under Edward III. and his house—to his English School Texts. The usefulness of these plain "texts" depends mainly on the willingness and competence of the teacher to supply the editing. In the hands of a

teacher who will take the requisite trouble they may be very useful indeed.

A sixpenny "Sohrab and Rustum" (11) will, we hope, win new admirers for this noble poem, which experience shows to be a favourite with boy-readers. The notes are good; we could have dispensed with the "appreciations" prefixed.

THE TEACHING OF LATIN IN SECONDARY SCHOOLS.

THE report of the Classical Association on the teaching of Latin (p. 425) marks a distinct advance in educational progress. Coincident with it there is issued by the Board of Education a Circular (No. 574) on the same subject, the recommendations of which are almost identical. While the latter, however, deals only with boys' schools in which Latin is taught, but not Greek, and not with girls' schools, the report is concerned with two classes of schools: (a) the public schools (and preparatory schools leading up to them) with a leaving age of eighteen or nineteen, and (b) schools under a local education authority with a leaving age of about sixteen. Girls' schools are not definitely mentioned, and it is not clear whether the Classical Association shares the opinion of the Board of Education that the problem of girls' schools is materially different, and that the suggestions made cannot be applied to them without large modifications.

But both the report and the circular offer this clear gain. They define the position of Latin in education and suggest a reasonable course for its study. They should put an end to the long period of indecision with regard to it. In the old days Latin was the chief, if not the only, characteristic of a secondary school. But with the introduction of new subjects like modern languages and experimental science, its position required readjustment. The teaching of Latin, to justify itself, must fill a definite function and pursue its aims with scientific precision. The circular leaves no doubt as to the importance of Latin in the curriculum of a secondary school. It is

an essential part of a complete modern education. No study of the development of European institutions is possible without a knowledge of Latin, for in it are contained the records of the development of law, religion, literature, and thought. Latin is an essential instrument for the educated use of the English language, and a knowledge of it is necessary to any scientific study of the Romance languages. A knowledge of the structure of the Latin language is the most valuable help to understanding the general principles of the European languages, and its regular and formal syntax is a valuable corrective to the loose phrasing which easily arises from the syntactical freedom of English.

The three objects of its study are again clearly stated in the circular to be:

(1) A careful and thorough knowledge of the structure of the language; (2) acquaintance with some of the most important authors of the classical period; and (3) as much knowledge as can be obtained of the history and life of

Rome, especially during the century preceding and the century following the beginning of the Christian era.

These objects are to be attained first by the proper correlation of Latin with other studies, and secondly by improved methods of teaching Latin itself. Latin should not be begun until boys have received a thorough grounding in the elements of English grammar, the analysis of the simple sentence, and the main kinds of relative and subordinate sentences. If they know so much before they begin Latin, they may afterwards dispense with separate instruction in formal English grammar. Latin should be begun about the age of eleven. It should not be begun at the same time as another foreign language. French should be learnt for at least one year before, and Greek should not be begun until at least one year after. When begun, Latin should have a lesson, if possible, every day, but not less than four times a week. All this is excellent. Equally excellent are the methods of instruction set forth alike in the report and the circular.

The course of work falls into two sections. The first is preparatory, covering one or two years. In the second the student is introduced to the Latin literature proper. The limitation of the preliminary period to two years is of the utmost importance, as this enables the student who has but four or five years for the subject ample time for a sound acquaintance with the chief literature. The object of the preliminary period, as the report puts it, is the acquisition of the knowledge of "common words, common forms, and common constructions," *i.e.*, of the essentials of vocabulary, accidence, and syntax, which will be most often required in reading a classical author. Non-essentials and all irregularities except those most frequently recurring are to be eschewed. At this stage a boy wants, and should get, a sound working knowledge of the main facts and principles of the language. Details and minutiae come later, and can be added as he goes along. The report wisely leaves to the teacher his discretion as to the precise method of instruction, but insists in the early stages on abundant oral work and plenty of translation and retranslation, usually in connection with the Latin text. The circular adds the vital principle that the work should be based throughout upon the study of complete sentences.

The courses recommended in the second section aim at broadening the usual course of reading and at giving a boy a better conception of the work of the great classical writers as a whole. If they be followed, a boy's knowledge of Latin at sixteen should be far less scrappy than at present, and he should get some idea of style and literary form. The whole report thus breathes an appeal to intelligence and common sense; it raises the teaching of Latin to a higher plane, and cannot fail of a far-reaching effect. But while it may have been an advantage to have considered separately the needs of the two classes of schools, in practice it will be impossible to draw any hard and fast line between them; many boys in public schools leave "at about sixteen," and many in the other

secondary schools will go on with Latin to a later age. The books recommended for the two classes are much the same; the objects pursued do not vary in essence, but only in quantity; and the only practical difference appears to be that one class goes further in its reading than the other, the latter besides making no attempt at continuous Latin prose or Latin verse. Any further attempt at differentiation seems to be adding another difficulty to the two which are alluded to in the report. The first is that of co-ordinating the work of boys who come to the secondary school later than twelve without having learnt Latin, and the other is the want of competent teachers for the important elementary stages of learning the language. The association is optimistic enough to think that the increased demand will create an increased supply.

THE TEACHING OF SHAKESPEARE IN SECONDARY SCHOOLS.

THE newly formed English Association seems likely to develop into an active society of teachers and others anxious to secure improved methods of teaching the English language and literature. The list of officers comprises the names of many authorities who have become known for their efforts to make the study of English literature a more attractive and important feature of modern education.

Though the first general meeting of the association was held as recently as January last, there are already evidences of the enthusiasm and activity of the executive committee and members. Lectures are given from time to time by distinguished scholars; the next will be delivered by Prof. A. C. Bradley at University College, Gower Street, London, W.C., on November 15th at 6 p.m., and is open to members of the association and their friends.

The association has begun also the publication of leaflets designed to assist teachers of English in their work. One of these is to deal with the teaching of Shakespeare in secondary schools, and the executive committee has sent out a number of suggestions—which are intended to form the basis of further discussion—in the form of a provisional leaflet. We are permitted to publish the suggestions, and we are hopeful that a study of them may lead many teachers to join the association, and subsequently to assist in the discussions. The hon. general secretary is Prof. F. S. Boas, Cranford, Bickley, Kent, and the hon. secretary and assistant treasurer Miss Elizabeth Lee, 8, Mornington Avenue Mansions, West Kensington, W. Applications for forms of membership should be addressed to Miss Lee.

PROVISIONAL SUGGESTIONS BY THE EXECUTIVE COMMITTEE OF THE ENGLISH ASSOCIATION.

I.

While some Shakespearean teaching may well form part of the lessons in literature at an earlier date, the study of the plays as a regular part of the curriculum should be deferred until the age of twelve. It should be as general as possible, and should not necessarily include the reading of the whole of any play. It should be concerned with (1) the stories of several plays; (2) selected passages in these (some being committed to memory); (3) the

characters in their leading features so far as young boys and girls can appreciate them.

The plays suitable for such study between the ages of twelve and fourteen are limited in number, the themes of many (e.g., "Othello," "Antony and Cleopatra," or, again, "Hamlet" or "Much Ado about Nothing") being beyond the pupils' experience and range of understanding. From several points of view, the eleven plays named below are specially suitable, and some such order as the following may be suggested: "Julius Caesar," "The Merchant of Venice," "Twelfth Night," "King John," "A Midsummer Night's Dream," "The Tempest," "As You Like It," "Henry V," "Richard II," "Macbeth," "Henry VIII."

The selected passages should be chosen at this stage for their poetic beauty as much as for their dramatic quality, and a song or a few detached lines may serve the purpose as well as the familiar sustained speeches. They should not at present be made a vehicle for grammatical or linguistic instruction, only such explanation being given as is necessary to their comprehension. Enough time should be secured for Shakespearean work to allow of the study of one play each term. This will necessitate, as a rule, two lesson periods a week.

II.

With pupils from fourteen to sixteen, considerable advance may be made upon the simple introduction which has been given at the earlier age. Pupils should be made acquainted with the chief facts of Shakespeare's career and the conditions of stage-representation in his time. The texts of the plays named above may now be thoroughly studied in suitable editions at the rate of about two plays a year. Attention should now be centred on (1) the general dramatic conduct of the plot; (2) the detailed delineation of character; (3) diction and metre; (4) verbal difficulties; (5) references and allusions; (6) sources of the story, and their treatment by Shakespeare. The following plays may now also be introduced into the school curriculum: "Richard III.," "Hamlet," "Coriolanus," "The Taming of the Shrew," and "Much Ado about Nothing."

III.

From sixteen upwards the students should be competent to make some comparison between Shakespearean plays or groups of plays as well as comparison with other dramatic work known to the pupils. The class-work should include consideration of a number of plays; attention should be drawn to the special characteristics of the Comedies, Histories, and Tragedies, to the change in Shakespeare's outlook and temper, and in his style and versification; some introduction might be given to Shakespearean criticism and bibliography.

In this stage paper-work, followed by the teacher's comments, will form an important instrument of education. In addition, sustained *viva voce* discussion by the class should be encouraged. The difficulty of providing critical books for all the pupils can be got over only by judicious selection on the teacher's part of readings from the leading critics. It is advisable that pupils should possess, however, one good text-book of Shakespearean commentary. Every school in which work of a fairly advanced nature is done should obviously possess a Shakespearean reference library. The English Association hopes at a later date to draw up a list of books suitable for inclusion in such a library.

As class teaching so often tends to be informative rather than to stimulate literary appreciation, a small point of

practical method should be consistently enforced. A few minutes of each lesson, however interesting the points may be that formally belong to it, should be reserved for the reading of some fine passages from the plays.

A scheme of similar nature to that outlined above will enable a teacher to direct and modify his teaching so as to preserve due balance among the various aspects of Shakespearean study. If certain of these aspects be unavoidably or deliberately omitted from the teaching, it is well to know exactly which have been so omitted; and a teacher's scheme might usefully be presented to inspectors in order that misunderstanding may not occur as to what has been taught.

REPORT OF THE CLASSICAL ASSOCIATION ON THE TEACHING OF LATIN.¹

THIS report falls into two sections, (A) that relating to the course of study in schools with a leaving age of eighteen or nineteen, and in schools preparatory thereto, (B) that relating to secondary schools under a local education authority.

(A) SCHOOLS WITH A LEAVING AGE OF EIGHTEEN OR NINETEEN, AND SCHOOLS PREPARATORY THERETO.

Preparatory Schools.—We have not felt it to be our duty to consider in detail the character or scope of the teaching that a child should receive in the early stages of its education, but we venture to express our conviction that it is desirable that the greatest importance should be attached at an early stage to the study of English. Before children begin the study of a foreign language they should have learned to use their mother tongue with some degree of correctness and fluency, both orally and in writing, and have acquired a good stock of words and a habit of orderly and connected thought. They should also have learned to read aloud with accuracy and intelligence, and, so far as possible, with taste; and they should have become familiar with a considerable quantity of good English prose and verse of a character suited to their age. A feeling for literature may thus be developed which, while of the highest value in itself, will also help the pupil afterwards to appreciate the classics. An elaborate study of English grammar is not useful at this stage. In English it is not form but function which in the main distinguishes the "parts of speech," and the chief aim of teaching should be to attain a mastery of the broad principles of sentence structure and the functions of words. The teaching of the elements of English should not be encumbered with distinctions which are not vital to English itself, but the fundamental grammatical notions should be taught in such a way as to prove a help when pupils approach the study of other languages.

Assuming, therefore, that the study of the mother tongue should precede the study of any foreign language, we desire also to direct attention to the disadvantages attending the common practice of beginning a second foreign language before the pupil has acquired an adequate knowledge of the first, and a third foreign language before the pupil has acquired an adequate knowledge of either the

¹ Report of a Committee of the Classical Association consisting of Prof. E. A. Sonnenschein (chairman), Rev. Canon G. C. Bell, Prof. R. M. Burrows, Rev. W. C. Compton, Miss Ethel Gavin (representative of the Head-mistresses' Association), Rev. Dr. J. Gow (representative of the Head-masters' Conference), Mr. A. E. Holme, Sir A. F. Hort, Mr. E. D. Mansfield (representative of the Preparatory Schools Association), Dr. G. G. A. Murray, Rev. Dr. J. A. Nairn, Mr. T. E. Page, Mr. W. E. P. Pantin, Mr. A. B. Ramsay, Dr. W. H. D. Rouse, Miss Adele F. E. Sanders (representative of the Assistant Mistresses' Association), Miss Lucy Silcox, Rev. Canon R. D. Swallow (representative of the Headmasters' Association), Mr. W. F. Witton (representative of the Assistant Masters' Association), Mr. C. Cookson (secretary).

first or the second. The elements of three foreign languages taught concurrently take up a very large portion of the school day, and pupils of only average ability naturally make very slow progress in any of the three languages, and consequently tend to lose interest in their work and to do it mechanically. We think that better results would be obtained if it were recognised that learners should never begin two languages at or about the same time, but should have been well grounded in the elements of one language before beginning a second, and well grounded in the elements of the second before beginning a third.

An adult who desires to learn a language finds that he succeeds best by working at it every day. In the same way we think that the best results are obtained at school when a pupil beginning a new language has a daily lesson in it. We have, however, good reason to believe that so obvious a principle is often forgotten, especially in girls' schools as regards the teaching of classics, and in some boys' schools which attempt a very wide curriculum. Yet if several days are allowed to elapse between one lesson and another, the original impression is often effaced and the work has to be done afresh. The method which we are recommending also tends to keep the pupils interested in their work and encouraged by the sense of making progress. We think that as a general rule pupils should devote themselves to the study of their first foreign language for at least a year before any other foreign language is taken up, and to their second foreign language for at least a year before a third foreign language is begun. When, as will often be the case, a modern language taught colloquially and at an early age is the first foreign language studied, we think that the study of Latin should not be postponed beyond the age of eleven. Greek should not be begun until the pupil is at least able to translate an easy piece of narrative Latin, and is so familiar with the commonest inflexions and constructions that he can use them correctly in composing Latin sentences of a simple character.

The Study of Latin: Methods of Teaching.—In the early stages of learning a language great demands on the memory are inevitable, and there is always a danger of making these demands excessive by putting before the pupil a bewildering mass of unfamiliar words and inflexions. In teaching the elements of Latin, we should restrict ourselves to what is of frequent occurrence. The really useful words, inflexions, and constructions should be introduced gradually, and thoroughly worked into the pupil's mind by constant practice in translating from and into Latin. By thus concentrating attention on what is of common occurrence it should be possible for the pupil, in a comparatively short time, to acquire a working knowledge of the language such as will enable him to pass without great difficulty to the intelligent reading of a Latin author.

It may be worth while to point out that the principle of concentrating attention on what is common and essential is constantly violated in practice. If we study the grammar questions set in the scholarship examinations of some of the public schools or in university matriculation examinations, we find such forms asked for as the ablative plural of *filia*,¹ the accusative singular of nouns like *tussis*,

amussis, the genitive plural of *accipiter* or *panis*, the gender of *gryps*, *hydrops*, or *acer* ("maple-tree"), the forms of Greek nouns as declined in Latin, and rare or non-existent comparatives and superlatives and "principal parts" of verbs, to say nothing of forms which, though they occur in classical authors, are no necessary part of the mental outfit of the beginner. The method of attempting to commit the whole of the accidence to memory at an early stage without practice in the use of the forms learned is kept alive by such questions, and the study of grammar is thus divorced from the study of actual speech. A similar criticism may be applied to the teaching of rare syntactical types, especially if they rest on imperfect evidence, such as *non dubito quin futurum sit ut urbs capiat*. An examination of the Public School Entrance Scholarship papers, reprinted in vol. vi. of the Special Reports on Educational Subjects (Board of Education), will show that many of the sentences set in them are not well suited to test, as they should, whether the candidate possesses a practical knowledge of the common constructions and a good working vocabulary.

As to the particular shape in which this practice in common words, common forms, and common constructions should be given, more than one method is possible. The use of a classical author at the stage contemplated is, indeed, excluded by the fact that no classical author satisfies the conditions; nor could extracts from the classics be made which would contain only the words, forms, and constructions required. But it is possible to present vocabulary and grammar either in the form of isolated sentences or in the shape of a connected narrative specially written for the purpose. Perhaps the best plan is to combine the two—that is, to construct a very simple narrative for translation into English and isolated sentences for translation into Latin. It is possible, though not easy, to write a connected narrative in which the new grammatical points are systematically introduced and the vocabulary gradually extended. The merits of this method are that sentences woven together so as to form a continuous discourse need not be more difficult or varied in construction, and are from the nature of the case more easily intelligible in their context than isolated sentences; that words, forms, and constructions embedded in a context of meaning acquire a certain energy and power of impressing themselves on the memory which they lack in isolation; and that the mere interest of the story contributes to the acquisition of the art of reading, as distinct from construing. On the other hand, exercises consisting of disconnected sentences for translation into Latin have their value. It is easier, if the writer does not attempt to form them into a continuous passage, to introduce exactly the words and grammatical forms in which the pupil requires practice, to concentrate his attention on some puzzling construction, excluding for the time other difficulties, whether of vocabulary or grammar, and by reiteration to make him thoroughly familiar with it. It is, perhaps, worth remarking that the pupil will not learn Latin from doing the sentences wrong: it is essential that, if approximate correctness is not attained, he should rewrite the sentences in which he has made mistakes, so that he may retain in his memory the impression of an idiomatic piece of Latin.

Public Schools.—In accordance with the recommendation of our interim report presented in January, 1906, the Classical Association has adopted the principle "that in the lower and middle forms of boys' public schools Greek should be taught only with a view to the intelligent reading of Greek authors." This principle, as we explained

¹ *Filius* is not wanted for the purpose of reading Latin literature until the pupil comes to the "Civil War" of Caesar (where it occurs once, II. 108, 3; for the sake of distinction from *filiis*) and the 24th book of Livy (where it also occurs once, chap. xxvi. 2, according to the MSS.; but the reading is doubted by Weissenborn); and here a reference to the dictionary will give the information required. Elsewhere Livy uses *filiis* in the sense of "daughters" (XXXVII. 57, 2, *ex duabus filiis*); so too Plautus twice, without any word to indicate the gender, such as *duabus* ("Stich." 567, "Poem." 1123).

in our report, does not exclude a study of grammar or the practice of simple forms of composition as means to the reading of Greek literature. But in Latin the function of grammar and composition must be defined differently; they should be studied not only as a means to the intelligent reading of Latin authors, but also as a linguistic discipline and with a view to training the mind in habits of clear and logical thinking. Perhaps, however, what needs more emphasis is that the literary and historic interest of the authors read should not be neglected even in the earlier stages of learning. It is too common even at the present day for teachers to set up a mechanical conception of Latin as a merely formal gymnastic, instead of regarding it as a literature capable of exerting a strong attraction upon the pupil and of becoming a powerful influence for the training of taste, the development of character, and the awakening of intellectual ambitions. It should never be forgotten that Latin literature has largely contributed to making the life and literature of the civilised world of to-day what it is. These two ends of formal and literary study are, however, not inconsistent with one another. Latin may and should be so taught as to realise them both at the same time. The practice of composition is of the utmost importance, not only as developing habits of clear thinking, but as giving a fuller insight into the spirit of the Latin language.

Objects of the Study of Latin.—The ends to be kept in view in the study of Latin are, therefore, two: (i) the intelligent reading of the more important Latin authors; (ii) a linguistic and logical discipline. In connection with the first of these ends, the committee desires to direct attention to the importance of planning out the course of reading on some well-considered principle, so as to make it as profitable as possible and representative of what is best in Latin literature.

Course of Reading.—Considering the fact that the majority of pupils will not read many new Latin books after they have left school, the committee feels that teachers cannot be too careful in the selections which they make of authors for study; much energy is wasted at the present time by a haphazard method of procedure. The committee has therefore considered (a) which authors are most worth reading at school, and (b) in what order they should be taken, in view partly of their linguistic difficulty, partly of the suitability of their contents for reading at different ages. In drawing up the scheme appended to this part of the report, the committee has had the advantage of the assistance of a number of experienced teachers who have co-operated with a sub-committee appointed for this purpose;¹ but the scheme is submitted only as a specimen, and not as necessarily the best that could be devised.

The suggestions of the scheme are based on the supposition that the pupil will go through a preliminary course of work on a reader. Whether this preliminary course lasts for two years or one will depend on the method of teaching employed. If Latin is taken after some mastery of French has been acquired, it may be possible to limit the preliminary grammatical work to one year. Otherwise two years will probably be necessary.

In making its selection of authors, the committee has tried to bear in mind the claims of both subject-matter and style. In most cases authors worth reading for their subject-matter are also worth reading for their style (e.g.,

Livy and Vergil); but where the two claims are to some extent opposed the committee has chosen such works as on the whole seem best suited to a particular stage of learning. For the earlier stages the interest of the subject-matter is of more importance than the beauty of the style; the capacity to appreciate style is developed later, and it is at the later stages that the style of the authors read begins to exercise an important influence on composition.

The committee has deliberately rejected certain authors as of inferior educational value—e.g., in the early stage, Eutropius and Cornelius Nepos; in the middle stage, Sallust;¹ in the latest stage, the Silver Age epic poets, whose works it is thought should form no part of the school curriculum, but be reserved for university study.

The committee thinks that encouragement should be given to the practice of not limiting the amount of reading done in school to what pupils have time to prepare out of school. The conventional system of "prepared construing" seems to need considerable modification. The traditional course of reading may be widened if time is allowed in class for reading ahead after the translation of the passages set for preparation; but passages read as unseens in class may with advantage be set for revision out of class.

The principle of using selections may be safely applied wherever it does not involve scrappiness of reading—e.g., it may be applied without sacrifice of unity to the Odes, Satires, and Epistles of Horace, and to the Elegies of Propertius. On the other hand, the principle of continuity should be more thoroughly applied than at present to certain works; the "Aeneid," for example, should be treated so far as possible as a literary whole, the several books being read in consecutive order, though possibly with some omissions of the less important parts, which might be read in a good English verse translation. In this connection the committee desires to direct attention to the important difference which exists between reading a book with some omissions and reading a collection of excerpts selected with a view to their individual beauty of thought or diction. By means of omissions it becomes possible in the case of long works, such as the history of Livy or the "Aeneid" of Vergil, to get a connected view of the story or message which the author has to communicate: whereas, if the attention of the pupil is confined to one or two books, he necessarily fails to get an idea of the work as a whole. To omit parts of a work which is too long to be read in its entirety is, therefore, the only practicable method of acquiring an understanding of its contents and unity.

A SPECIMEN COURSE OF LATIN READING.

I. Preliminary Stage (Ages Ten or Eleven to Fourteen).

FIRST YEAR.—Preparatory course.

SECOND YEAR.—*Prose:* Simplified Caesar—e.g., part of B. G. IV., V. ("The Invasion of Britain"); or, simplified Livy—e.g., passages from Books II. and IX. *Verse:* Some fables of Phaedrus (omitting the "morals," which are difficult) and some easy selections from the elegiac poems of Ovid.

THIRD YEAR.—*Prose:* Dramatic scenes and incidents from Livy—e.g., passages from Books V., VII., VIII. (not simplified); or episodes (not simplified) from Books

¹ The sub-committee consisted of Sir A. F. Hort and Prof. Sonnenschein, together with the following co-opted members: Prof. E. V. Arnold, Mr. C. G. Botting, Mr. Butcher, Mr. M. O. B. Caspary, Mr. R. C. Gilson, Prof. Hardie, Prof. Mackail, Mr. M. J. Rendall, Miss Slater, Mr. H. Williamson.

¹ The rejection of Sallust in favour of Livy has the support of Quintilian ("Inst. Orat." II. 5. 19). In answer to the question, "qui sint legendi in cipitibus?" he says, "Ego optimis quidem et statim et semper, sed tamen eorum candidissimum quemque et maxime expositum velim, ut Livium a pueris magis quam Sallustium."

V., VI., VII. of Caesar's "Gallic War." *Verse*: Stories from Ovid's "Fasti" and "Metamorphoses," or a miscellaneous selection of Latin verse.

II. Advanced Stage (Ages Fourteen to Eighteen).

FIRST YEAR.—*Prose*: Cicero: one or more of the easier orations, such as "In Catilinam," I., III., "Pro Lege Manilia," "De Provinciis Consularibus," "Pro Ligario," together with passages of some length from other speeches, such as the "Verrines," Actio II., Books IV. and V., and some stories of Roman life or easy letters of Cicero. *Verse*: Vergil, "Aeneid," I. and II.

SECOND YEAR.—*Prose*: Livy, XXI. and XXII. (as much as possible of these books, not omitting the battle of Cannae in the later part of Book XXII.). *Verse*: Vergil, "Aeneid," III., IV., and V. (considerable portions of Book V. might be taken for rapid reading in class); a few select Odes of Horace.

THIRD YEAR.—*Prose*: One of the longer speeches of Cicero, or part of the "Civil War" of Caesar, together with the "Somnia Scipionis" and the praise of literature in the "Pro Archia" (sections 12-32); the "Agricola" of Tacitus. *Verse*: Vergil, "Aeneid," VI. and parts of VII.-XII.; select Odes of Horace.

FOURTH YEAR.—At this stage there will naturally be much freedom of choice.

(a) The following books are suggested as necessary to complete the above scheme of reading. *Prose*: One or more books of the "Annals" or "Histories" of Tacitus; one or more books of a philosophical or rhetorical treatise of Cicero (e.g., "Tusculan Disputations," Book V., or a book of the "De Oratore"); a few selected letters of Cicero. *Verse*: Horace: select Satires and Epistles; selections from Catullus and Propertius; Lucretius: Book V. and selections from other books; Juvenal: three or four Satires.

(b) The following books are suggested as less essential; some of these might be taken for rapid reading in class. *Prose*: Cicero, "De Amicitia" and "De Senectute"; Livy: some of the later books; Quintilian, Book X.; Seneca: a treatise such as the "De Clementia," or selections from the "Epistulae Morales"; Pliny: select letters. *Verse*: Plautus or Terence: one or two plays; Vergil: some of the "Eclogues" and "Georgics."

(B) SCHOOLS WITH A LEAVING AGE OF ABOUT SIXTEEN.¹

Hitherto in this report we have had mainly in view those schools where the leaving age is eighteen or nineteen, and to which boys proceed from preparatory schools where both Latin and French are included in the curriculum. There exists, however, a large and increasing number of secondary schools of which the pupils, to a great extent, receive their early education in public elementary schools up to the age of twelve or thirteen, afterwards proceeding to the secondary schools for three or four years.

When it is remembered that on entering the secondary school the pupils have usually no knowledge of any language but their own, and must begin the study of mathematics, science, and other non-literary subjects, it is plain that the complete and systematic study of Latin, both linguistically and as literature, which is both desirable and attainable under the conditions of the schools hitherto dealt with in the report, will be quite out of the question in schools of this type.

Yet the teaching of Latin by such methods as will lead

to results of permanent value at the close of a boy's career is desirable in such schools. The study of Latin gives a training in clearness of thought and accuracy of expression not easily obtained from the study of a modern language, introduces the pupil to the life of the ancients, is a necessary preliminary to the study of the origin of modern institutions, and assists in the comprehension of English literature.

The study of Latin in such schools has, in the past, met with the opposition of many parents, largely because on the older system of teaching the average boy rarely gained any real knowledge of the language in the time allowed. It will, therefore, be necessary rigorously to limit the scope of the work attempted to what can reasonably be accomplished in the time available—not more than four or five lessons a week for three or four years.

If in this time some tangible results could be attained by the average boy, such as the power of reading the easier Latin authors and some acquaintance with Roman life and history, the subject would be more popular than it has been hitherto.

We therefore recommend that in these schools Latin should be taught with a view to the intelligent reading of the easier Latin authors, and to supplying that discipline in clear and accurate thought which is not so readily obtained from the study of a modern language.

It is specially important to ignore all that is uncommon in grammar, and to ensure a thorough knowledge of the grammatical forms and constructions commonly occurring in the authors read, and not to use composition except as a means of understanding and remembering these forms and constructions. To gain these ends a scheme of work is recommended of which the following may be taken as a sample:

First year.—A reader with grammar and exercises based on the text and systematically graduated.

Second year.—Simplified narrative passages from Latin prose authors, with graduated exercises as before.

Third year.—Easy portions of Caesar and Cicero, with selections from Tibullus or Ovid, together with grammar and exercises as before.

Fourth year.—Whole books selected from the works of the following authors: Cicero, Livy, Tacitus ("Agricola"), and Vergil. Some letters of Pliny and Odes of Horace may be read. Or the books set for a matriculation examination.

The standard aimed at should be that of the Senior Local examinations, or of university matriculation or preliminary examinations; and this would generally be reached by those who had passed through the fourth year's course satisfactorily. It is important that, after the first year, reference should constantly be made to a simple manual of accidence and syntax.

We are of opinion that not less than four periods a week should be devoted to Latin, and strongly urge one lesson a day where possible. The suggestion has been made that time might be saved for this purpose if the formal teaching of English grammar were combined with that of the Latin grammar and dispensed with as a separate subject.

A difficulty will arise in co-ordinating the work of elementary-school pupils with that of the boys who have been in the preparatory department of the secondary school itself, since the latter will usually have learnt some French, if not some Latin, before the age of twelve. This difficulty is obviated in most schools by a separate classification for Latin and French, at any rate in the lower forms, by which means also the boys may be taken in smaller numbers for languages than for other subjects.

¹ In the preparation of this part of the report, the committee has had the assistance of a sub-committee consisting of the Rev. Canon Bell (chairman), Mr. A. E. Holme, Mr. W. F. Wilton.

The elementary stages of learning are the most important, and the work should be entrusted to the most competent and experienced teachers. Such teachers are at present few in the schools we are considering, but, as in the case of the newer methods of teaching French, the demand will doubtless create the supply.

RESOLUTIONS.

On the basis of the above facts and suggestions, the committee submitted certain resolutions for the consideration of the general meeting of the Classical Association on October 19th. Eventually the following were adopted:

1. That it is not desirable to begin the school study of two foreign languages, ancient or modern, at or about the same time.

2. That in the earliest stage of teaching Latin and Greek the teacher should aim at making his pupils very familiar with such words, inflexions, and constructions as occur most commonly in the authors, and especially the first author, to be read at school.

3. That the scheme of reading in Latin and Greek authors should be carefully organised and graduated with a view (1) to the selection of such authors as are suitable in respect of both their language and their subject-matter to different stages of learning, (2) to the literary and historical value of the authors or parts of authors selected. And with a view to the attainment of this object, the same simple narrative, prose, or verse should be selected as far as possible for the younger pupils.

HISTORY AND CURRENT EVENTS.

WHAT is a "Dominion"? We ask for information. There are two "dominions" in what appears to be a modern meaning of the word, the old "Dominion" of Canada and the new "Dominion" of New Zealand. Australia is not a "dominion"; it is a "commonwealth," and that is the only other federated part of the British Empire. The word must have *some* meaning; else why should Canada congratulate New Zealand on her accession to the title, and New Zealand reply that she "heartily thanks her elder sister and hopes to follow in her footsteps"? It cannot mean a federation, for New Zealand is a unitary State; and so, for the present, we "give it up." But why should New Zealand want to be a "dominion," whatever it means? Is it because she thinks she thus secures herself against any temptation to join the "Commonwealth" of Australia? There are those thousand miles of salt water that formerly were her reasons for holding aloof; and now Western Australia at least seems to be repenting of her entrance into the union. The "Commonwealth" of Australia does not seem to attract New Zealand.

"All alike must work together in one same allegiance and love of country. Then our German nation will become the block of granite upon which the Lord our God can build up and complete His work of civilising the world. Then, too, will be fulfilled the words of the poet who said: 'The German spirit will one day prove the world's salvation.'" It has been the fashion to laugh at the present German Emperor and his ideas for Germany, but perhaps that is only because he puts those ideas in language which has gone out of fashion among ourselves. We similarly believe in the "Anglo-Saxon" mission to civilise the world, and we even think our peculiar methods of government suitable for all sorts and conditions of men. But, since the seventeenth century, we have ceased to express this in the language of religion, at least in the

older sense of that word. But is not that because, with the growing intensity of the "nationality" idea, that system of thought has become itself a religion? Certainly it has, in each country, its demigods, its creeds, and its intolerance, all marks of the early stages of religion.

THE specific subject of history, considered as a branch of science, is the phenomenon known as the State. As the botanist studies plants of all kinds, and the astronomer studies stars, so the historian studies States. But the unsatisfactory nature of the science of history is shown by the difficulty in defining the word "State," and by the objections made when one desires to include under the definition bodies of men not usually known by that name. Suppose, e.g., that we define it as "a body of men united together under one Government, which has power to enforce its decrees," and quote, by way of example, a cricket team under the command of its captain. We are charged with mere trifling. We grant it is not a very high type of a State, but the botanist does not reject low types of plants. What, then, are we to say, as students of history as a science, to this: "At Fenagh, county Leitrim, in September last, Mr. T. F. Smyth, M.P., appeared before the executive of the South Leitrim United Irish League to answer charges made against him by the Carrick-on-Shannon branch of having acted as auctioneer of certain meadows . . . in opposition to the desires of the local branch of the League. After heated discussions, apologies from Mr. Smyth were accepted"? Why did Mr. Smyth go, and why did he apologise, if the League were not able to enforce its decrees?

WE have travelled far nowadays from the doctrines of *laissez-faire* and the Manchester School. Then we thought that government had nothing to do with industry and commerce but let them alone. That was because the hindrances imposed by old-time regulations were hopelessly out of date, and were simply hampering the new advances. But the theories of Bentham and his disciples were, as all political theories are, put forth as eternal truths, everywhere and everywhen applicable. Even then the beginnings of doubt were expressed in Factory Acts on behalf of women and children; but it was long supposed that grown men were capable of taking care of themselves, and wanted no statutes to protect them against exploitation. That position has now been abandoned, and the last stage, so far, has been reached in the return to what would, fifty years ago, have been called grandmotherly legislation in the proposals of Australia to "impose an Excise duty equal to half the Customs duty on all goods manufactured in Australia, the Excise to be remitted when the conditions under which the goods were manufactured were fair and reasonable."

ITEMS OF INTEREST.

GENERAL.

So the Register, which has for so long been a subject of discussion among teachers, is to disappear. The *coup de grâce* was given to it by the Education (Administrative Provisions) Act passed last Session. The new register for which the Act provides is to contain a list of all teachers in one column. The distinction between Column A and Column B, which has caused so much heartburning, will exist no longer. But there is to be a separate column, in which will be recorded the "attainments, training, and experience" of each teacher. To establish and maintain this register a new Registration Council will come into existence, which is to be representative of the whole teaching profession. The composition of this council will no

doubt be closely watched by all educational associations. It will be interesting to see whether such associations as the N.U.T., the Assistant Masters' and Mistresses' Associations, and the Headmasters' Association will be allowed representation *qua* associations, or whether representatives of the various classes of teachers will be chosen without regard to their being members of these bodies. Again, on what principle will the number of representatives allotted to each class be fixed? These and other like questions will need, and will no doubt receive, careful consideration by the Board of Education. Whatever may be decided, it is to be hoped that the new register will receive the support of the whole profession in a larger measure than did the old, and will prove a means of securing for it the status and recognition which it should have.

A MOVEMENT is on foot to establish a General Educational Congress, to be held annually in London, on some date in January. For this purpose some centrally situated building would be chosen, in which all educational associations might hold their annual meetings, and also unite in holding a joint congress to discuss matters of general interest. Sectional meetings, of course, might also be arranged. To make such a scheme really successful, the co-operation of all the associations concerned is needed; otherwise it will mean only the addition of another to the already long list of isolated educational bodies. Though there are manifestly difficulties in the way of its realisation, the idea of bringing together for discussion and interchange of views the different sections of teachers and others interested in education in this way is distinctly a good one. At present, we believe, though many associations have provisionally approved of the scheme, it can hardly be said to have assumed a practical shape.

IT was only natural that attention should have been directed to the future position of the college and to the status of its existing associates at the annual distribution of medals and prizes of the Royal College of Science, London, on October 3rd. On the same day a letter from an associate of the college appeared in the *Times*, in which the possibility of the abandonment of the name "Royal College of Science" and the associateship of the college was discussed, and the steps taken by a large body of past associates to bring the facts of the case before the authorities were detailed. The Charter establishing the new Imperial College of Science and Technology—in which the Royal College of Science, the Royal School of Mines, and the Central Technical College are to be incorporated—contains certain definite provisions. The charter provides for the retention of the name and associateship of the Royal School of Mines, and that the institution hitherto known as the Central Technical College shall assume the name of the City and Guilds College, and that the privilege enjoyed by the City and Guilds of London Institute of granting diplomas shall not be affected by the new arrangements. The Royal College of Science is treated exceptionally. There is no provision for the retention of its name, no specific instruction as to the continuance of the widely recognised diploma of "Associate of the Royal College of Science," and no arrangement for the preservation of the privileges of existing associates.

MANY references were made to this letter at the prize distribution of the Royal College of Science. The Dean thought the letter had been written "a little hastily and in a moment, apparently, of irritation"; but the course of action referred to in the letter has extended, we hear, over several months. Sir William White urged the writer of the letter to consider the matter from a national point

of view, and other speakers mentioned the letter in similar general terms. But the specific points put forward temperately by the *Times* correspondent were left untouched. We understand that past students share the widespread desire to create a great Imperial college, which will focus present endeavours to provide the highest form of training in pure and applied science, and extend existing facilities. They recognise fully the difficulties with which the new governing body is confronted, and believe sincerely that national well-being is the primary consideration to be borne in mind. This attitude, however, is not inconsistent with a desire for equality of treatment. It still remains necessary for the authorities to explain why what is right and proper for the Royal School of Mines and the Central Technical College is unnecessary and undesirable for the Royal College of Science.

THE Board of Education has issued regulations and syllabus for the preliminary certificate examination of December, 1908, and March-April, 1909, and for the certificate examination of December, 1909. Application to sit at either examination will be received up to August 31st without fee, during September with a fee of 5s., and afterwards, if places are available, with a special fee of 2s. The lists will be alphabetical and without classification, but will specify the subjects in which candidates have obtained distinction. Despite the difference in the average ages of candidates, the two syllabuses are similar, and in some subjects identical, though candidates for the certificate will be expected to show a more thorough grasp of principles than is demanded at the preliminary examination. In history, the section on civics has been transferred from the preliminary to the final stage. The Board has for so long had the monopoly of the worst geography syllabus in the examination world, that the new detailed course here set out deserves a warm welcome. Individuals may question the value of some of its details, but as a course for elementary teachers it appears quite excellent and well proportioned. The science syllabuses have again been overhauled, and are now unified. Examinees must take the introductory section, and may offer, in addition, chemistry or physics or botany. An interesting experimental course of rural science and gardening is, for certificate candidates, alternative to this. Besides the study of the essentials of botany, the work to be done in the garden includes the practical cultivation of a dozen kitchen vegetables, and the various methods of propagating plants. The experience of many teachers goes to prove that this is a valuable innovation, likely to induce a love of scientific study in those rural teachers who have had no previous opportunity for its pursuit. The need of such a course is shown in the lack of persons competent to deal with rural science in village day and evening schools: this gap should soon be filled. The latest certificate regulations are an improvement upon those of earlier years, and if the standard of the examination is gradually raised, the Board of Education will have done well.

THE new scheme of scholarship examination at Clavesmore School, to which reference was made in our issue for August last (p. 308), proved very successful. The underlying principle of the scheme is non-specialisation in the case of boys under the age of fourteen or fourteen and a half years. The reports of the members of the interview committee have been presented to the governors of the school and published for distribution. Mr. Clodesley Brereton, who was a member of the committee, deals with the whole work of selection in another part of the present issue, and it is unnecessary here to give further particulars.

THE Child-study Society, London, which was formed by the amalgamation of the Childhood Society and the London branch of the British Child-study Association, commenced its meetings for the present session last month. Lectures will be continued during November and December, and the subjects selected should appeal specially to teachers. Dr. J. W. Slaughter will discuss play as a factor in education; Mrs. Scharlieb, who is specially qualified to deal with the question, will lecture on the physical training of adolescent girls; Mr. A. H. Hogarth will describe the school clinic; Prof. John Edgar will take up the subject of imitation and individuality in children; Dr. Francis Warner will speak on the constitutional development and social progress of boys and girls from infancy; and Miss Alice Ravenhill will announce some results of an investigation into the hours of sleep amongst elementary-school children in England. Particulars as to the dates of the meetings and tickets of admission may be obtained from either of the honorary secretaries, Miss Kate Stevens and Mr. W. J. Durrie Miford, at the Parkes Museum, Margaret Street, London, W.

AT the recent annual meeting of the Union of Lancashire and Cheshire Institutes, Mr. J. H. Reynolds, director of higher education, Manchester, read an important paper on a plea for the more systematic organisation of evening schools. He pointed out that the number of pupils on the rolls of the elementary schools of England and Wales was, in 1905, 6,070,530, while the average number in attendance was 5,249,485. The number of pupils remaining in the schools at thirteen years of age is estimated at not more than 300,000, whereas it ought to be not less than twice that number. In the sixth standard and above it there are fewer than 330,000 children enrolled; whilst in Manchester only one-ninth of the children are above the fifth standard. That is to say, a very large number of children fail to reach any standard beyond the fifth, and leave school just at the very time when their minds are becoming more receptive to knowledge and their powers of appreciation of its purpose and results are increasingly felt.

THERE is evidence, Mr. Reynolds maintains, of satisfactory, if slow, improvement in the attainments of students entering the evening schools; but it is still a matter of well-founded complaint on the part of teachers that they are compelled, by reason of the inadequate knowledge and insufficient previous training of the students, to spend the greater portion of the session in dealing with subjects of a purely elementary and preliminary character rather than with the special studies in which the student is interested, and for which the teacher is expressly engaged. The evening school in the present circumstances must, under very difficult conditions, supply the deficiencies of the elementary schools—due to the short stay of large numbers of pupils therein, and to the fact that many students do not seek the evening school until two or more years have elapsed. It is of the utmost importance to secure as a first step the enrolment of the scholar immediately he leaves the day school in the classes of the evening school. This is done in Manchester, with a fair measure of success. A return of scholars leaving the elementary schools is supplied weekly, and a free ticket is issued giving such scholars free admission to a continuation school. In succeeding sessions the pupils pay their own fees, and it has been found that 50 per cent. of these free students continue their studies.

MR. W. B. STEER, of Derby, is this year the president of the National Federation of Assistant Teachers, and he

delivered his presidential address at the recent conference of the association at Leeds. Summarising the results of the 1902 Education Act, he said: "The 1902 Act has belied its promises; the secondary system has not been democratised; there has been no striking improvement in our primary system; the wide gulf between the two has not been bridged over; large classes still prevail; unqualified teachers still abound; clericalism still stands in the way; bureaucracy is an added element of danger; democracy is exercising but a shadow of control." Referring to the demand for economy in the administration of elementary education, he remarked that "the clamour for economy is met, not by any curtailment of expenditure upon excessive officialdom, but always, everywhere, by the dismissal of class teachers or by the curtailment of their already meagre salaries. Economy is effected, not by a cessation of expenditure upon the trappings and ornamentation of the educational machine, but by a serious interference with the effective parts of the machinery. Money spent on education offices, on education secretaries and advisers, on agenda papers, on clerks, on inspectors, whether Government or local, on buildings, on apparatus, on stationery and attendance officers, on elaborate returns of attendance and on reports, is money absolutely wasted unless there are competent, earnest teachers in the classrooms, and many economies could be effected in mere paraphernalia if the question of cost were but faced in the spirit of true statesmanship."

MR. STEER also considered the question of the unattractiveness of the profession he represented. In his judgment, "the inadequate remuneration of the teacher is the real cause of the inadequate supply, and money now lavished on futile attempts to make the profession look attractive would be better spent in making the attraction real. The medical profession shows no shortage of supply, and the country does not find it necessary to provide bursaries for its future doctors. The country's money is not being spent in securing its future supply of engineers or lawyers. To the young man of fair ability industry will bring promotion and content. It is only in the teaching profession where arduous toil on the steeps does not bring sure repose on the summit; and until the prospects of fair remuneration are greatly improved there will ever be periodic recurrence of a shortage of supply." The president's concluding remarks, however, struck a higher note. Speaking to his colleagues particularly, he urged them on to better things, notwithstanding small salaries, irksome regulations, and scant recognition. "Teacher," he said, "toil on, and in thy toil rejoice. Do not lose your enthusiasm; do not yield your ideals. For you 'tis ever to toil on the steeps, and though for you the repose on the summit may never come, still toil on. Be ever loyal to your task; be ever loyal to the child. True reward for your work may never come—indeed, can never come until the eternal balance assesses it at its true worth. Still toil on. Your labour is its own reward."

PERSONS interested in the special period of British history prescribed for the English Teachers' Certificate Examination for 1908 might profit by the first three papers in the series of "Teachers' Notes on British History" which Mr. C. S. Fearnside is contributing to these columns. These will be found in our issue of December, 1906 (preliminary survey); March, 1907 (1688-1748); and June, 1907 (1748-1783). The papers, together with the fourth dealing with the years 1783-1815, which appears in the present issue, cover the period of British and foreign history prescribed for the Joint Board Examination next summer.

THE following resolutions were passed at a recent meeting of the Commercial Clerks' Society held in Berlin : (1) That attendance at commercial continuation schools should be compulsory for all persons engaged in commerce up to their eighteenth year, and for both sexes. (2) That the commercial continuation school should have power to refuse admission to those insufficiently prepared. (3) That when a merchant does not possess sufficient knowledge to train an apprentice, the right to take apprentices should be withdrawn from him. (4) That the ratio between the number of clerks and the number of apprentices be settled legally by commercial committees. (5) The examination of apprentices at the end of the course should receive official recognition. (6) That commercial inspectors be appointed to check the hours of work, and the conditions of life for those who reside with employers. (7) That attention be given to the erection of homes for clerks in which their education, amusement, and exercise will be properly supervised. (8) That a thorough revision of private commercial schools and their methods, though necessary, can only be made on the initiative of the Imperial Parliament. Until this occurs local authorities must be warned to keep a strict eye on the work of the private schools.

THE Birmingham and Midland Branch of the Classical Association has invited the association to hold its next general meeting in Birmingham. The resolution conveying this invitation was proposed by the Bishop of Birmingham, and seconded by the Lord Mayor of Birmingham, at a meeting of the committee of the branch, together with friends of classical education in the city and the neighbourhood, held near the end of September. Mr. Asquith has accepted the office of president of the association for the year 1908.

WE have received from Mr. Ch. V. Jogarao, of the Maharajah's College, Vizianagaram, a pamphlet entitled "A Plea for the Translation Method." To those who have been following recent developments in modern language teaching, it will be interesting to know that this burning question is being discussed in India in connection with the teaching of English. Mr. Jogarao's arguments hardly contain anything novel, and will certainly not convince our reformers here. The matter is at present being discussed in the columns of our contemporary, *Modern Language Teaching*, and we understand that it will also be prominent among the subjects to be dealt with at the annual general meeting of the Modern Language Association, which will be held in London early in January.

THE October number of the quarterly *Science Progress* (Murray, 5s. net) contains several articles of considerable interest to the general reader. In a paper on "Bread," Mr. A. E. Humphries describes the modern improvements in the production of this important article of diet. He states that in the case of every type of wheat used the white flour of commerce yields more nutriment to the body than wholemeal. In a review of recent study of the factors controlling the supply of food fishes, Mr. J. Johnstone explains the curious fact that marine flora and fauna are both most abundant in cool waters. It appears that in the warmer seas the greater activity of the bacteria of denitrification causes a scarcity of the ultimate food-stuffs of the diatoms, &c., on which fishes directly or indirectly subsist. The articles on "Economic Entomology" and "Economic Ornithology" by Messrs. R. Lydekker and F. V. Theobald respectively, that on "Photomicrography" by Dr. Alcock, and that on

"Insects and Fungi" by Mr. T. Petch, are also of general interest. Recent research on more severely technical subjects is admirably dealt with in the essays of Prof. Dendy on "The Pineal Gland," Prof. Hartog on "The Dividing Cell," Mr. A. Harker on "Igneous Rock-magmas," Mr. F. J. Lewis on "The Sequence of Plant Remains in British Peat Mosses," and Mr. W. C. Worsdell on "The Origin of the 'Flower.'"

MR. W. L. EVANS, in discussing the atomic theory in *School Science and Mathematics* for October, urges that if the theory is introduced to students at too early an age they are apt to confound the theory with fact, and to arrive at the stage when they believe that matter is actually made up of small particles called atoms; and he remarks that this difficulty arises through the correspondence between fact and theory being so complete that the former is regarded as a proof of the latter. He then proceeds to point out the services which the atomic theory has rendered in the development of the science of chemistry. Further paragraphs explain briefly how investigations on the discharge of electricity through gases suggest the existence of masses which are sub-atomic in character; and reference is made to the absence of proof of the absolute uniformity in mass of every ultimate atom of the same chemical element. In contributions on "The Chemistry Note-book," Mr. H. S. Reed maintains that no fixed rule for keeping note-books can be applied, since the student's welfare depends so much more upon the personality of the teacher than upon his method of regulating details. He deprecates the use of "set form" note-books, in which blank spaces are left to be filled in by the student; he insists upon lots of good drawings of essential parts of apparatus, and suggests a method of periodically "grading" the note-books of a class instead of laboriously marking each exercise. Dr. W. C. Collar writes upon the ideal conditions for teaching physics. These ideals are : (i) the teacher's mastery of the subject; (ii) adequate time for his work and study—school committees erroneously think that the more teachers teach the better they earn their wage; (iii) not too many pupils in a class; and (iv) freedom in method and syllabus.

THE annual general meeting of the Association of Teachers in Technical Institutions will be held on November 9th, at 3 p.m., in the South-Western Polytechnic, Chelsea, London.

THE Civil Service Commissioners announce an examination for assistant examiners in the Patent Office. Applications must reach Burlington Gardens not later than November 6th. November 21st is the last day for sending in applications to sit for the forthcoming examination for not fewer than 110 appointments as assistants of Excise. This examination is the second under the new scheme; other particulars of these appointments appeared in THE SCHOOL WORLD last November.

SCOTTISH.

THE precise meaning of article 42 of the new regulations for the training of teachers has all along been a matter of grave doubt. The generally accepted view was that all teachers in secondary schools would be recognised, *ipso facto*, as qualified to teach higher subjects. It would have been well to rest content with this understanding until the Department had clearly shown that this was a wrong interpretation. Unfortunately, certain sections of teachers have asked for a definite ruling on the subject, and Circular 406 is the reply. By the terms of this circular it would seem that it is only a very small pro-

portion of existing teachers who are to receive recognition under terms of the article, viz., those "with a genuine specialist qualification" and holding "important and responsible positions."

THE new definition is quite as vague as the old, but it is quite clear that the number of individuals that can come under it is exceedingly small. Teachers, therefore, all over the country are gravely apprehensive of the effect of the regulations upon their present and future professional status, and protests against a literal interpretation of the terms quoted above are coming in from every section of teachers. Everyone must sympathise with the principle of demanding adequate qualifications from all teachers, whether engaged in primary or secondary schools, but all reforms should have regard to present conditions and to existing interests. It will probably be found that teachers are reading more into the regulations than the Department intends. There never was a time when the interests of teachers were more sympathetically considered than at present, and if the profession will only have patience it will be found that no real injustice will be done to any individual by the Department's interpretation of either article 42 or Circular 406.

THE action of the Edinburgh School Board in instituting a missionary propaganda to arouse interest among employers and employees in the continuation classes of the city might well be followed by other centres. A representative of the School Board, a headmaster who was temporarily freed from his school duties, called upon more than 400 employers of labour in the city, explained to them in detail the nature of the work carried on, and in almost every case secured their aid in placing before their apprentices the importance and necessity of attendance at one or other of these classes. In addition, numerous meetings of employees, both adults and apprentices, were addressed by members of the School Board, who have undertaken this duty with great earnestness and success. Already the attendance for this year shows an increase of 40 per cent. over that of last year.

SEVERAL circulars have been issued by the Education Department in regard to the next written examination for leaving certificates, which will begin on April 7th, 1908. The attention of teachers is specially directed to the modifications proposed in the character of the examination papers in English, classics, and modern languages. History and geography are still to be integral parts of the English paper in the lower grade, but in the higher grade three papers will be set, one in English, one in history, and one in geography. In classics no change will be made in the lower grade paper, but in the higher grade two papers will be set, two hours being allowed for each. In the higher grade paper in Greek, two passages of verse will continue to be set for translation, and one of them will be an extract from Homer, as formerly. The liberty of choice between these two passages is now withdrawn, and candidates must attempt both. In modern languages two papers of two hours each will be set on the higher grade standard. A dictation test will be included for the first time, and, as formerly, candidates will be required to reproduce in the foreign language a story that has been read aloud to them in English.

THE question of university reform has been so long dissolved in speech, that it seemed as if it never was to be precipitated into action. The governing body of Glasgow University, however, under the direction of its new chief, Principal MacAlister, has prepared an ordinance which

gives practical effect to the main contentions of university reformers. The academic year is to extend from October 1st to the end of May. For the present compulsory winter and optional summer session there is to be substituted a three-term session, with breaks at Christmas and Easter. The number of subjects for the Arts degree is reduced from seven to five or six. Every student must give an intensive study over two sessions to one or two subjects of the curriculum, and a higher standard will be exacted in such subjects. The ordinance does not touch the question of the preliminary examinations, but it is stated that a separate ordinance is being prepared dealing with that subject.

THE Education Department has issued a circular to teachers and managers dealing with the new requirements in history and geography. Accompanying the circular is a specimen paper in each subject. The first impression one has of the history paper is that the field is far too wide to be covered successfully by the average secondary-school pupil. It includes, in addition to English history, Greek and Roman history, European history, and a detailed knowledge of Scottish history. A careful study of the questions, however, shows that the world's history, other than British, requires to be known only in its broadest aspects, and it is certainly not too much to ask pupils to locate in time events of such far-reaching influence as the Capture of Constantinople, the Invention of Printing, the Discovery of America. The questions on Greek and Roman history will be heartily welcomed by classical teachers, to whom this part of the subject will be gladly left by their English colleagues. The papers on geography represent the new spirit in its best form. The questions set are all directed to bring out the intelligence of the pupils, and to test their knowledge of essential principles and their practical application. But, as Thring was fond of saying, "Time is the lord of all progress"; and where is the time to be got for the greatly increased demands of these two subjects?

THE annual general meeting of the Educational Institute of Scotland was held this year in the McEwan Hall, Edinburgh University. In the course of his retiring address, the president, Mr. John Mudie, Dundee, referred to the repeated failures of the Government to pass an Education Bill. There had been plenty of playing with the subject, bringing forward Bills that were never really meant to pass, but made an effective bit of "window-dressing." All this they had had five times over, but no real determined effort to give Scotland her long overdue measure of educational reform. Mr. Mudie did not seek to apportion blame for this condition of things, but he indicated very clearly that on the Secretary for Scotland would rest the responsibility if he allowed another session to pass without a whole-hearted endeavour being made to bring the educational administration of the country into line with present-day needs.

THE subject of superannuation was the *pièce de résistance* in the day's programme. The official demand of the institute is that the Government should contribute from moneys accruing to Scotland sums equal to those granted by school boards to retiring teachers, always provided that the total pension from all sources will not exceed two-thirds of the teacher's salary at the time of retirement. A small, but by no means insignificant, section of teachers has opposed this principle, and has asked that all teachers should receive the same pension, regardless of retiring salary. At the general meeting there was a full-dress

debate on this point, and the meeting resolved by a practically unanimous vote to support the action of its executive. It is satisfactory to find the threatened schism in the ranks of the teachers thus averted. Superannuation is not a popular subject with any Government. If it is dealt with at all, it is always of necessity and not of choice. If teachers break up into rival camps on this subject no Government will feel impelled to deal with the subject. Union is strength at all times, but never more than at the present crisis.

IRISH.

THE exhibition and prize lists of the Intermediate Education Board for 1907 are distinctly disappointing. Never have so few exhibitions been awarded; and many candidates whose marks any time in previous years would have secured them an exhibition have to be content with a mere prize. Exhibitions are, as usual, awarded only in the senior, middle, and junior, and not in the preparatory grade. There are in each grade two classes. The values are: senior grade—first class, £40; second class, £20; middle grade—first class, £25; second class, £15; junior grade—first class, £15; second class, £10. The numbers awarded are as follows:

	Boys	Girls	Total
Senior grade, first class	18	7	25 } 41
" " second class	14	2	16 }
Middle grade, first class	19	11	30 }
" " second class	30	7	37 }
Junior grade, first class	24	13	37 }
" " second class	60	18	87 } 124
Total	174	58	232

THE corresponding totals last year were: boys, 279; girls, 106; total, 385. The *Irish Times*, commenting on the difference between 1906 and 1907, said in a leading article that the Commissioners "ought to have given notice of the proposed reductions. Their results may mean the serious upsetting of the plans of many youths and girls who are now hovering on the verge of their careers in life." The number of prizes awarded is very nearly the same as last year; the values are £3, £2, and £1 in all the three grades, and the numbers awarded are:

	Boys	Girls	Total
Senior grade	40	13	53
Middle grade	65	29	94
Junior grade	142	55	197
Total	247	97	344

Last year the totals were: boys, 230; girls, 87; total, 317.

AT the end of September the new buildings of Queen's College, Belfast, were opened, by which the single laboratory is replaced by eight laboratories fully equipped and up to date. This enlargement is mainly due to the Better Equipment Fund, which now amounts to more than £70,000. The laboratories now consist of the " Harland Laboratories " for physics and engineering; the " Donald Currie Laboratories " for chemistry, with a sanitary science museum; the pathological or " Musgrave Laboratories "; the physiological or " Jaffe Laboratories "; the medical buildings, with a new lecture theatre and operating room; and the natural history, biological, and geological laboratories. Lord Keivin, who had promised to open the new buildings, was unable to be present, but his address was read, in which he traced the development of the Queen's College in Belfast, and strongly urged that the time had now come when it should be converted into the University of Belfast. Sir Christopher Nixon, Vice-Chancellor of the Royal University, while he did not

object to Belfast having a university of its own if it so wished, pleaded for the solution of the university question on the lines recommended by the Robertson Commission, viz., a reconstituted Royal University with an endowed college for Roman Catholics.

MR. BIRRELL made his first public appearance this autumn by opening early in October the new Municipal Technical School at Kingstown. This has been erected at the cost of £5,500, secured on the rates. The number of pupils last year was 441. In a somewhat discursive address the Chief Secretary commented on the dissatisfaction with the intermediate awards, and declared that he was quite sure that the examination system required to be reorganised and reconstructed. The efficiency of intermediate schools must, he supposed, be tested by some kind of examination, and the problem was to find a system whereby the teacher and the examiner would co-operate, the object being to find out how far a class had benefited by the instruction it had received. It was on the same lines that he was anxious to have a new university for Ireland, open for the teaching of all classes of students.

A PRACTICAL difficulty in the development of technical instruction in Ireland is the want of money for buildings. The new Kingstown buildings, for example, mean that an annual sum of £200 must be deducted from the income to pay the interest on the £5,500 borrowed. Mr. T. W. Russell, the new vice-president of the Department, in reply to a deputation in reference to this matter of grants for buildings, declared that Ireland was at a disadvantage as compared with England, because she was at least ten years later in the field. When buildings for technical instruction were raised in England with the " whisky " money, Ireland was not ready, and the money was given to primary and intermediate education. Both these branches of education are still under-endowed. The only money the Department has for science work is ear-marked—£55,000 a year for technical education, £7,000 out of the development grant, £25,000 for secondary schools, and £10,500 for the new evening classes. The question of building grants was a matter for the Treasury; this would amount to £250,000 for fifty urban districts, besides the needs of the small rural centres.

THE president of Queen's College, Galway, in his report for the year ending last June, reports that the number of students was 111, of whom fifty-three were from Connaught and thirty-nine from Ulster. There were seventeen women students. The president claims that the results achieved fully entitle the college to claim equal rank with the other Queen's Colleges in any university scheme which may be proposed by the Government, especially when consideration is taken of the utterly inadequate endowment of the college and the pressing need of further funds for assistants, lecturer, and the additional equipment of various departments.

WELSH.

THE Cardiff School Management Committee has drawn up a prize attendance scheme. In Welsh schools the question constantly arises of holidays taken and often given in connection with religious organisations. Should such absences be counted against the scholars or not? The Cardiff Committee has decided that "the absence of scholars in council schools on the occasion of their Sunday-school treats, Band of Hope outings, or the like, for one day in the year be not counted against them as absences under the prize scheme, provided that satisfactory evidence be tendered to the head-teachers of the attendance of the

scholars at the treats, outings, &c." At the same committee meeting it was decided to make a general regulation prohibiting canvassing on the part of applicants for posts under the committee, an exception being made in favour of applicants chosen for "short lists."

At a recent meeting of the Llanelly Education Committee, an agreement was made between the committee and the managers of the local Church of England voluntary school that the school should not be worked within the grants, and not become chargeable to the rates. On a recommendation from the managers for the appointment of two assistant-teachers, it appeared that the salaries would bring the total expense to more than the grants provided. But the school had received the money known as "special aid." The question arises: Is special aid a grant? Of course, it is open to argument that the allocation of such "special aid" is, at all events, not an encroachment on the rates.

At Cardiff an appeal for financial aid has been made to the Secondary Schools Committee by the Heathfield House Catholic Pupil Teachers' Centre, which has been established three years. The application has been rejected by five votes to two. It was stated that the committee had had to give forty-nine pupil teachers notice, and that it could not absorb into its schools all its own pupil teachers, and that thus there was no need to train so many unless they could be used.

ANOTHER county intermediate school has been opened at Mountain Ash. Lord Aberdare has given the site, and the Navigation Company has given a valuable piece of land to provide a road to the school. At present only temporary premises are provided, with accommodation for 180 pupils.

AT Llangollen Intermediate School there are now 120 children on the lists, the full number which the schools were built to accommodate. The governors have passed a resolution to supply pupils upon entering the schools with books and stationery fees.

THERE is still the bitter cry that Wales is being "penalised for her success in secondary education." A movement has been started from Cardiff to induce all the borough and county authorities in Wales to join in appointing a strong deputation to wait upon Mr. McKenna in regard to the matter. At a meeting of the Carmarthenshire Education Committee it was stated that the county of Carmarthen would suffer a loss of between £1,500 and £2,000.

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

V. Hugo, Le Coup d'État. Edited by J. W. Longsdon. xxiv+120 pp. (Arnold.) 1s. 6d.—Mr. Longsdon has carefully edited the greater part of the first three books of "Napoléon le Petit"—a work in which Victor Hugo shows his splendid powers of over-emphasis in vituperation. The anecdote quoted on p. xix, according to which Napoleon, after glancing through it, said: "Voyez, Messieurs, voici 'Napoléon le Petit' par Victor Hugo le Grand," is delightful. Mr. Longsdon has written an excellent introduction, and notes which are correct; they err on the side of brevity, unfortunately an unusual error. A good selection of subjects for free composition has been added, and a few English passages for retranslation and for composition. The text is carefully printed; we have

noticed *égalé* for *égale* (p. 66, l. 5). In the note on p. 24, l. 17, "folded" would perhaps be better than twisted. A map of Paris would render more interesting the account of *le crime du deux décembre*.

Dumas, Aventure de D'Artagnan en Angleterre. Edited by K. Auchmuty. 48 pp. (Blackie.) 4d.—This episode from "Vingt Ans Après" deserved inclusion in the "Little French Classics" as a good specimen of Dumas's melodramatic writing. The notes are good, and a *questionnaire* has been added, in which are included questions on grammar and etymology. The questions are divided into sets according to the pages of the text; it would have been better to divide the text into suitable sections.

The Sounds of the French Language. By Paul Passy. Translated by D. L. Savory and D. Jones. viii+134 pp. (Oxford: Clarendon Press.) 2s. 6d.—M. Passy's "Sons du Français" is an admirable and well-known book. It is naturally written, in the first place, for French readers. The idea of translating it and adapting it for English readers was a good one, and as far as the translation is concerned the work has been very well performed. We cannot help feeling, however, that something more might have been done to help the English beginner in phonetics, and, if necessary, space for this might have been gained by the omission of references to the sounds of very remote languages. The book has been carefully printed, and slips are very rare. The decision not to use the single dot to indicate half-long vowels has in some cases led to awkward results (e.g., on pp. 45, 62). The anecdote at the end of § 73 is repeated in the footnote on p. 34. To say that in English "nasalization hardly exists" (p. 67) is incorrect; the remark is not found in the original text. On p. 73 *Theater* has been added to the words with glottal stop; but this pronunciation is not good. The rendering of *pour* by "reinforced from" (§ 233, end) is unhappy. Though familiar with the book, we had not previously noticed M. Passy's little joke in the selection of *a* and *s* in § 38 and *a* and *n* in § 163.

Les Classiques Français. Issued under the general editorship of H. W. Allen. (Dent.) Cloth, 1s. 6d. net; leather, 2s. 6d. net.—Among recent additions to this delightful series we note Beaumarchais's "Le Barbier de Séville" and "Le Mariage de Figaro," with a preface by Jules Claretie; La Bruyère's "Caractères," with a preface by Augustin Filon; Montesquieu's "Lettres Persanes," with a preface by E. Faguet; and Voltaire, "Contes Choisis," with a preface by Gustave Lanson. These are editions which it is a pleasure to handle; we know of no French ones as reasonable in price and as dainty in form.

Parlez-vous Français? By K. Fitzgerald. 78 pp. (Longmans.) 1s.—The sub-title is "Le Français enseigné d'après la Méthode Directe." There is, however, no introduction to show the teacher how the book is to be used. It may be regarded as a "direct-method" book, inasmuch as the text is all in French; but there is also a vocabulary—and a very incomplete one, too. The reading matter consists of conversations, poems, and songs which occupy more than half the book. The illustrations are not of high quality; and some, notably that on p. 56, are very poor.

Cassell's Penny French Classics. Edited by de V. Payen-Payne.—This is really wonderful value for money—twelve classics for a shilling, and good introductions into the bargain! Such enterprise deserves success. The works that have appeared so far are: Racine's

"*Plaideurs*," Musset's "*On ne badine pas avec l'amour*," Mme de Sévigné's "*Lettres et Pensées*," Boileau's "*Art Poétique*," stories by Mme de Ségur, Books I. and II. of La Fontaine's *Fables*, Corneille's "*Cid*," Balzac's "*Une passion dans le désert*," Perrault's fairy-tales, two *contes* by Voltaire, two of Bossuet's "*Oraisons funèbres*," and Molière's "*Précieuses Ridicules*"—truly a banquet with dishes for all tastes. These booklets are also issued in limp cloth at 3d. each.

English.

Sohrab and Rustum with other Poems of Matthew Arnold. By W. P. Trent and W. T. Brewster. xxv+107 pp. (Ginn.) 1s. 3d.—This is a carefully done volume with a really good account of Arnold prefixed by way of introduction. The notes are few but sufficient, and are placed at the foot of the pages. There are some illustrations, and the selection of the poems is capital. The book is in all ways adapted to introduce young students to a further study of Arnold.

Burke on the Proposals for Peace. Letter I. By F. J. C. Hearnshaw. xxxvi+95 pp. (Clive.) 1s. 6d.—This edition is adapted to students for the intermediate arts course at London University. A great amount of information is put into very small compass, and so conveyed as to enable any bright candidate easily to acquire a good working knowledge of his subject.

A Commentary on Browning's Sordello. By K. N. London. 212 pp. (Sonnenschein.) 1s. 6d. net.—This is very good. It is but a small volume, but it deals satisfactorily with the subtleties and obscurities of Browning's most difficult work. Students will find it valuable; but it also deserves a place on the library shelves of the ordinary lover of literature. Nothing better that we know of is in the market.

Essays and Letters of Charles Lamb. By A. Guthkelch. viii+152 pp. (Bell.) 1s. 4d.—This book is conceived upon an original plan. The ten essays and sixteen letters comprised in it are so arranged and dated as to cover Lamb's life, and present his works in an auto-biographical form. The notes are short but well done. A handy and interesting edition.

The Shorter Poems of Longfellow. By G. Clifford Dent. 48 pp. (Dent.) 3d. net.—A small selection of Longfellow's verse, characteristic of that poet at his best for the most part, and a serviceable addition to a noteworthy series.

Midsummer Night's Dream. By I. W. Iliffe. xxvii+113 pp. 1s. *King Lear*. By A. V. Houghton. xxxii+140 pp. 1s. (Longmans.)—Two small editions, very well done, practicable, comprehensive, well illustrated, and in all respects useful.

Supplement to Coriolanus. By Stanley Wood. 24 pp. (Gill.) 6d.—A capital addition to the accurate and handy Dinglewood Shakespeare Manuals.

History.

A History of Scotland for Schools. Part I. By P. Hume Brown. xiv+304 pp. (Oliver and Boyd.) 1s. 6d.—Dr. Hume Brown's name is a sufficient guarantee for accurate history, and we know by perusal that this book is quite readable and suitable for school children. Beginning with the Stone Age, the story of the country is continued to the death of James V., and is interspersed with all the

interesting episodes of that period, while the more serious aspects of history are by no means forgotten. We do not know a better introduction to the history of Scotland for school children on either side of the Tweed.

An Illustrated History of England. Period II. 403-763 pp. (Rivingtons.) 2s.—We recently noticed the first part of this book. The second part strikes us as more correct than the other for home affairs, but the author is not familiar with the European history of the time. The consequence is a confusion at times in the accounts of our foreign policy; otherwise the book is good. It brings the history down to the present year. It is provided, as its title announces, with illustrations, among which are reproductions in small of the armorial bearings of our sovereigns. There is also an index.

Stories from Roman History. By E. M. Wilmet-Buxton. viii+117 pp. (Methuen.) 1s. 6d.—The author divides his stories into two parts, the "legends" and the "true stories" of Rome. The first of the latter is that of the Caudine Forks. But in both parts the stories are told as stories, and are well adapted to our younger pupils. There are no pictures, but there are a short list of chief events and an index. It is a pity that the last chapter, sketching the history from 14 to 476 A.D., should be called the "fall of the Roman Empire." Justinian would have been astonished, as well as Otho III. and Henry VII.

A Junior Greek History. By W. H. Spragge. 124 pp. (Methuen.) 2s. 6d.—A sketch of Greek history on the usual lines, from the earliest period to the fall of Corinth, illustrated with four maps and four photographs. There are an index and an appendix of short notices of the chief men in Greek literature, art, and philosophy.

A First History of Greece. By E. E. Firth. viii+78 pp. (Methuen.) 1s. 6d.—We are afraid that Miss Firth will not succeed in her "attempt to arouse the interest of young people in the heroes of Greece," for in our opinion "the language has" not "been made as simple as possible," and the questions she sets would puzzle older folk. The poetry, too, with which she illustrates most of her chapters, takes much thought. But her book would supply useful hints and illustrations to teachers.

Notes of Lessons on English History. Book II., 1603-1906. 208 pp. (Pitman.) 3s. 6d.—We have already noticed (July, 1907) the first "book," and the same remarks apply to the present section.

Geography.

The Americas. By J. B. Reynolds. 128 pp.; pictures, diagrams, and maps. (Black.) 2s.—This is one of an illustrated series of Regional Geographies by the same author. Pictures, statistics (not later than 1905), diagrams, and maps are all instructive, and the letterpress is interesting. Throughout, the author rightly insists on the importance of cause and consequence; it is not sufficient merely to inquire where Chicago and St. Louis are, but why they are where they are; the names of the Alleghany peaks are as nothing compared with the influence of the whole range on the political and economic history of all the States east of the Mississippi; the unequal incidence of rainfall in South America is an interesting fact, and the knowledge of it necessary, but not nearly so educative as the working out of the important results following from this inequality. These examples show the lines upon

which the book is written. It is therefore to be commended alike to teachers and taught. The style is not too "stiff"; the pictures are very good; print and paper are excellent. That the maps are without scales, and some of them without lines of latitude and longitude, and that there is no index, are defects which should be remedied in a future edition. The questions set are more by way of examination puzzles than the practical exercises which we should prefer, but as one of the objects of the book is to enlighten candidates on what lies before them in geographical examinations of the standard of London matriculation, this may be an acceptable feature. We should have liked, by the way, to see some questions set on the really capital pictures—another hint for another edition.

A New Geography of the World. Anon. 208 pp.; diagrams and maps. (Chambers.) 1s.—This book has, we think, little but its cheapness to recommend it. The preface is promising: "great attention to Commercial Geography," "a concluding section on Physical Geography of a more advanced character," "great care to ensure accuracy of detail," "most recent statistics," are all effective baits. But granting (purely for the sake of argument) that the commercial geography is "commercial," that the physical geography is "advanced," that the details are accurate and the statistics recent, we are still at a loss to understand why in these latter days of improved geography teaching so antiquated a style of book should appear. There are pages after pages of lists—boundaries, capes, peninsulas *et hoc genus omne*—written out to look like descriptions; there are hardly any attempts to trace the relation between cause and effect; the majority of the maps are poor and scaleless. It was surely upon books of this sort that our rulers at the Foreign Office were fed in their infancy; the recollection alone would be cause sufficient for their recent action in excluding geography from the list of subjects for the Service Entrance Examination.

Philip's Standard Time Dial. Designed by Prof. R. A. Gregory. (Philip.) 3s. 6d.—A simple, neat, and easily workable instrument by means of which time questions and the necessity for "time standards" can be explained. In a solid board, 19 in. \times 16½ in., is inserted a movable disc 9½ in. in diameter, on one side of which is represented the northern hemisphere and on the other the southern. The great land masses are shown and their names given in bold type. The meridians are marked off in 15°s. Round the board are arranged hour figures to correspond. By moving the disc, each place 15° E. or W. of Greenwich comes into position an hour fast or slow as the case may be. With the disc at rest and the prime meridian placed at 12 noon, time is indicated all over the world with reference to Greenwich. The "standard times"—e.g., N. America, Japan, British South Africa—are marked with separate labels attached to their central meridians. The dial should make the understanding of these various points easily intelligible to junior classes.

Mathematics.

Arithmetic for Schools. By J. B. Lock. New edition, revised and enlarged, with the assistance of V. M. Turnbull. viii + 480 pp. (Macmillan.) 4s. 6d.—Commendation or criticism of a book which has had so large a circulation as this one is out of place. The chief change in this edition is the omission of certain articles dealing with matter of a technical character, such as duodecimals, scales of temperature, chemical compounds, equations of payments, foreign coinage and exchange; Horner's method

of obtaining cube roots is also omitted. The exercises have been carefully revised.

The Leader Arithmetic. By George Merchant. Six parts. Parts i.-iv., 64 pp.; parts v., vi., 56 pp. (Simpkin.) Paper covers, 3d. each.—The title-page of each part bears the following description of the contents: "A series of very carefully graduated exercises in arithmetic, with rules, explanations, and worked examples in the higher parts, suitable for all elementary schools, and the lower forms or classes of other schools, but specially intended for children who leave school when about fourteen or fifteen years of age." These words may be taken as stating the aim the author has in view. The least satisfactory portions of the work seem to us to be the "explanations" in the higher parts; these will often require considerable supplement from the teacher. The examples themselves, however, seem to be carefully graduated, especially in the earlier parts, though the number of examples of a formal character is perhaps excessive. Recurring decimals are treated in part iv., but very little attention is given to approximate methods; surely approximations are of much greater practical importance than the cube root or permutations and progressions discussed in part vi.

The Methodical Arithmetic. By W. J. Greenstreet. Parts i. and iii., each 24 pp. (Dent.) Paper covers, 1½d. each.—The books are designed for pupils in elementary schools, in accordance with the code of regulations issued by the Board of Education, part i. for first standard and part iii. for third standard pupils. The questions are nearly all of the concrete type; it is difficult to frame hundreds of such questions without falling into a depressing monotony of phraseology, but the questions proposed in these two parts are wonderfully free from trivialities, and there is very great variety of expression, while almost all subjects that would interest children have been drawn upon for examples.

Bell's New Practical Arithmetic for Elementary Schools. By W. J. Stainer. Seven books. (Bell.) Pupil's copy, first six books, paper 3d. each, cloth 4d. each; seventh book, paper 4d., cloth 6d. Teacher's copy, seven books, each, paper, 8d. net.—The pupil's copy contains exercises, each book comprising one year's work; the teacher's copy contains, in addition to the exercises, answers to the examples and suggestions on methods of teaching. The work differs in many respects from most, if not all, of the books written for elementary schools. From the general preface we learn that the chief consideration kept in view in preparing it has been that the object of the teaching is to enable the children to *think clearly and systematically about number*, rather than to perform, even with accuracy, operations which are but dimly understood. Only after the simple rules have been arrived at by the application of "common sense" are exercises proposed for the purpose of cultivating rapidity and mechanical accuracy. Exercises involving weighing and measuring, designed to correlate the subject with drawing and elementary science, are introduced at an early stage. An attempt is made to lead the pupils to appreciate the processes and methods that are often considered to be peculiarly suitable to algebra by inserting "symbolic exercises" at all stages of the course, though the literal notation of algebra does not appear until the third year, and then only in its most elementary form. The design of the book seems to us to be excellent, and the manner in which it has been carried out is, so far as a comparatively brief examination shows, very satisfactory.

The real test of the book will be found, however, in the daily work of the class-room. We sincerely wish that the method expounded in this arithmetic may have a genuine trial; should it prove successful—and we do not see why it should not—the gain would be great.

Science and Technology.

Hydraulics. By S. Dunkerley. Vol. i. vi+343 pp. (Longmans.) 10s. 6d. net.—The subject-matter of this volume is hydraulic machinery; a second volume is to follow dealing with the resistance and propulsion of ships. The early portion of the volume contains explanations of the flow of a perfect fluid and of fluid friction. In the succeeding portions, pressure machines, reciprocating pumps, turbines and centrifugal pumps, are described and their theory discussed. The hydraulic gun brakes in use in the Royal Navy are fully described; Prof. Osborne Reynolds's inventions and investigations occupy a considerable part of the volume, the last chapter being entirely devoted to his investigations on the motion of water and on the theory of lubrication. The book is intended for use in the universities and in the Royal Navy, and students will find that the subjects are for the most part treated in an able manner. The value of the book would be much enhanced by a careful revision to eliminate printer's and other minor slips, which in some cases will lead to mental confusion on the part of the reader who is only beginning his study of hydraulics. It would also be better to insert the description of the Kimberley electric pumping plant in its proper place among centrifugal pumps; the footnote on p. 192 referring to this mistake conveys the impression of hurried compilation. The book contains many well-drawn examples of hydraulic machines, and, in spite of its defects, will be welcomed as a valuable contribution to the literature of this important and difficult subject.

Steam and other Engines. By J. Duncan. ix+471 pp. (Macmillan.) 5s.—Much more space than is comprised in a comparatively small volume of this kind seems to be necessary to deal with such an important and comprehensive subject; but on examination of the book it must be admitted that the various sections are dealt with in an exceptionally clear and able manner. The early portions are taken up with illustrated descriptions of the details of an engine; then follow chapters dealing with Temperature, Heat and its Measurement, Properties of Gases, the Indicator, Valves and Valve Gears, Boilers, Compound and Triple Expansion Engines, and Locomotives. The chapters on Steam Turbines and Motor-car Engines will be of great assistance to those who wish to become acquainted with the best modern practice in these latest developments in engineering. The data of a number of tests of steam, gas, and oil engines are given, and in a final chapter there are brief but clear descriptions of the more important early types of engines. Numerous exercises are provided in the various chapters, and these, together with a collection of examination papers, the answers to which are supplied, will be useful to teachers and students. The book is one which ought to be in the hands of every engineer interested in any form of engine.

In Nature's Storyland. By Edith H irons. Second edition. x+113 pp. (Philip.) 2s. 6d.—Consists of a number of fairy-tales, intended for use in simple nature lessons to infants. The stories themselves cannot fail to interest young children, and they are illustrated by attractive drawings, by E. K. Reader.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

The Interpretation of Classical Authors.

In the admirable paper on "Unseens," by Prof. G. G. Ramsay, published in the June number of THE SCHOOL WORLD, there is the following sentence: "It is discouraging to find that when a student comes across a word printed with a capital letter, he should hold himself relieved of the responsibility of finding out anything about it at all. Proper names are often thus regarded as negligible quantities," &c. This has for its moral what is surely a truism, both as regards proper nouns and common ones, viz., that it is desirable for students to ascertain their point, or in simpler words, to find out what their author is talking about. The instances of pupils' shots quoted by Prof. Ramsay in respect of Horace are amusing, but if one looks a little further back and consults the commentators, one feels inclined to excuse the student for thinking that it does not matter by the value of the proverbial "two straws" whether he believed Patara, for instance, to be situated in Lycia, Sicily, or the moon.

Prof. Ramsay, in complaining of the careless student, is laying the foundation for a charge that may fairly be brought against the commentator whose function it is to evoke the intelligent interest of the student. An attentive reader of Horace's three books will soon come to the conclusion that Horatian comment, which, as Mr. Wickham truly says, we have derived from fifteenth- and sixteenth-century scholars without anyone except Bentley having made any considerable independent addition to it, often treats the words which are printed in capitals in an unenlightened manner, and exempts itself, with inadequate excuse, from inquiring into their point and application. As a matter of fact, they contain important and often traceable clues to the meaning of that work which, although so fascinating, is really unintelligible—as Markland had the acumen to perceive and the candour to confess—on the lines of interpretation followed by tradition.

Consider, for instance, such a name as Telephus. It is not sufficient to state that Horace has applied the name of a mythic king of Mysia to one of his characters. The question why he has done so is worthy of examination. Some deny the utility of such a proceeding, on the ground that no definite answer can now be returned. I disagree: but even granting that we get no further than this, that Horace must be taken to have had *some* reason for such a selection, it is incumbent upon us then not to construe him, and interpret him, and weigh his poetry in the scales of criticism, in utter disregard of the existence of such a reason; and this is precisely what has been done by many commentators of the author. The late Prof. Nettleship once began a paper with the question whether there was anything new to be said about Horace. Let that thought not deter any inquirer whom the poet may attract. There is an immense amount both true and new—to modern ears—to be found out on the unimpeachable authority of contemporaneous literature.

Prof. Ramsay's words offer an occasion for directing attention to this, which perhaps, in view of the great interest of the subject, you will allow me thus shortly to "improve."

E. R. GARNSEY

Sydney, N.S.W.

Pupil Teachers and Continental Holiday Courses.

UNDER the scholarships scheme of the Sheffield Education Committee, grants of £5 are made to students of the Pupil Teacher Centre who have passed certain qualifying examinations to enable them to spend their summer vacation attending a holiday course on the Continent. The experiment was first tried in 1906, when a party of thirteen girls availed themselves of this privilege and spent a month at Dijon. The course there was good, and everything was done by Prof. Lambert, the secretary, to make the visit of the students pleasant and helpful.

This year one boy went to Marburg, five boys to Besançon, and eleven girls to Nancy. The experiment has proved so successful that a few details concerning this last party as a type of all may prove useful and interesting. The party, which left Sheffield on July 25th, consisted of eight matriculated students who received the grant from the Education Committee, three others whose parents paid their whole expenses, and myself, acting as conductor. As it was necessary that we should cut down expenses where possible, we travelled third class all the way (second class on the boat), and we found that this third-class travelling on the Continent was not so terrible a thing as it is often supposed to be.

We went via St. Pancras, Newhaven, and Dieppe, and arrived at Paris on the morning of July 26th. A bus awaited us at the St. Lazare Station, and after leaving our luggage at the East Station we were taken to a pension near the Luxembourg Gardens. We spent the whole of our first day abroad and the early part of the next in seeing the sights of Paris, and as the weather was not too hot we were able to visit the Panthéon, Église St.-Etienne, Notre Dame, Palais de Justice and Sainte Chapelle, Jardins des Tuilleries, Hôtel des Invalides, Champs Élysées, Arc de Triomphe de l'Étoile, and Louvre without excessive fatigue. We left Paris in the evening, and arrived at Nancy before ten.

Arrangements had been made for the reception of the girls at a *maison de famille*, and the accommodation there was excellent. It was well appointed in the style of a middle-class hotel. It had been built primarily to receive foreign students. Among the residents during the stay of our party were Germans, Russians, Roumanians, Chinese, Indo-Chinese, and Frenchmen. Except during three days there were no other English people in the house. In this cosmopolitan party the only common language was French, and the social intercourse in the house was an excellent supplement to the university course, as it gave ample opportunities for, and indeed necessitated, practice in French conversation. The food and cooking at the *maison de famille* were good, the study-bedrooms were comfortable, a piano in the *salon* gave opportunities for music, &c., and altogether life there was very pleasant. The ordinary charge *en pension* was from 140 francs per month.

I had an early interview with M. Antoine, the director of the *maison de famille*, and a professor at the university course. It was agreed that the most important part of the work for our students would be conversation and pronunciation, and M. Antoine kindly offered to give them a series of special lessons at the *maison de famille* in place of some of the lectures at the University, which, it

was thought, would be less valuable. This he did, and they proved very profitable. He took the greatest pains to teach them the pure French sounds, and gave them excellent exercises to afford practice in the production of these sounds.

The university course was very well arranged. Lessons usually began at eight o'clock in the morning, and thus the hottest parts of the day were left free. There was no official division of the course into elementary and advanced sections, students being at liberty to attend as many of the lessons as they chose. The secretary and other professors were always willing to advise individuals as to the courses best suited to their stage of efficiency. In deciding which classes our students should attend, more attention was paid to the method of teaching and the rapidity or otherwise of the speaker than to the subject-matter, as it was felt that the matter could very frequently be learnt equally well from a text-book at home, and that the chief object of our students was to gain as great facility as possible in understanding and speaking the language, and to improve their pronunciation.

In M. Antoine's lessons at the University students were called upon to read aloud from some prose text, and were then asked questions upon the meanings of words, their grammatical relations to others, their derivation, &c. At other times conversations were introduced upon topics indicated beforehand.

M. Moutier, another professor, required the students to prepare a story beforehand, and several of them, chosen by lot, had to mount the platform and tell it in French to the rest of the class. This proved too trying an ordeal for the majority of the English students, but the Germans showed the results of their better language training in a lack of hesitation and self-consciousness. Other lectures on the history, geography, and institutions of France, literature and phonetics, were more valuable to the more advanced French scholars.

Nancy is a very fine town, and is situated in the midst of beautiful country. About two miles away is the extensive forest of Haye, which provides beautiful promenades and excursions. The town itself is of considerable historic interest. M. Antoine upon two or three occasions accompanied the Sheffield students to point out the places of interest in the town. This afforded further opportunity for practice in French conversation, and was much appreciated. In addition to this, two excursions were arranged weekly to places in the town and neighbourhood for the whole of the students attending the summer course at the University.

When I rejoined the party a few days before the end of the course I had some opportunity of judging the progress made by the students. In one or two cases I was delighted with the fluency of speech exhibited, and, as far as I could see, all had found the course profitable.

We left Nancy on August 22nd, and, breaking our journey at Metz and Luxembourg, reached Brussels in the evening. The next day was spent in viewing Brussels, and at night we crossed from Ostend to Dover. Saturday was spent in London, and we reached Sheffield in the evening.

The experiment, then, has proved very successful; for whilst it has been valuable to the students in their study of the French language, it has also widened their mental horizon considerably, and has furnished a most enjoyable holiday. The total cost for the month, including travelling expenses (from London), board and lodging, university

fees, and personal expenses, need not exceed £13 5s., and if the party returned through Paris instead of going through Brussels, this could be reduced to £12 or even less!

L. C. DUDLEY.

Sheffield.

The Supply of Secondary-school Teachers in the West Riding.

I NOTICE in the paragraphs on p. 390 of your October issue where you deal with the third annual report of the West Riding Education Committee, you comment on the statement in the report that "the committee has recently utilised a valuable source of supply by extending, in cases of special merit, certain county major scholarships on the condition that the holders shall serve for a two years' period in some approved secondary school in the West Riding."

Your comment is that it remains to be seen to what extent the schools will suffer from a succession of untrained teachers. On p. 21 of the report, from which the extract is taken, I see that I have omitted to state that these major scholarships are renewed for an extra year for the special purpose of training, and during that year the holders either take a special course of secondary training at an English university or are sent abroad to a foreign university, and in all cases obtain a diploma or certificate of efficiency as teachers.

Wakefield.

A. V. HOUGHTON.

[WE are glad to learn that, though there is no mention of the important fact in the report, due provision is made by the West Riding Education Committee for the training of the major scholars who become secondary-school teachers.—EDITORS.]

The Refractive Index of a Liquid.

A PLANE parallel glass plate is pressed lightly by suitable springs against the reflecting surface of a concave mirror. The combination is mounted on an optical bench, and the radius of curvature, R , of the concave surface is determined by one or more of the usual methods. The space between the glass plate and the reflecting surface is filled with the liquid, and the object on the bench is moved to a position where image and object are equidistant, D , from the mirror. Then it can be readily proved that the refractive index of the liquid = $\frac{R}{D}$.

I have found that, by using good optical materials and employing the knife-edge method of locating the foci, the refractive index of a liquid for monochromatic light can with ordinary care be determined correct to the third decimal place.

The radius of curvature of the mirror is practically constant, and when once this has been determined the measurement of the refractive index depends on the measurement of a length. The axial displacement of the foci by the plane glass cover plate gives rise to a small correction, which need not be applied in an elementary experiment.

The advantages to be claimed for this method are :

- (1) The optical arrangement is a simple one.
- (2) The experiment can be performed with ease.
- (3) The calculation presents no difficulty.
- (4) Only a small quantity of liquid is required.

F. W. JORDAN.

Canterbury.

Enunciations of Euclid, I., 13 and 14.

I HAVE read with much interest many of the English publications treating of geometry on modern lines. I observe that one of the guiding principles in the treatment of the subject is to make the enunciations of propositions as clear and concise as possible. But I fail to see the application of this principle in enunciating Euclid, I., 13 and 14, which, by common consent, are taken first. May I, therefore, invite opinions from teachers on a new form of enunciation for the theorems under reference?—a form that seems to me to be the best for the following reasons: (i) it is at once concise and clear; (ii) of all forms of enunciation it shows most clearly that the second theorem is the converse of the first; (iii) these being the very first set of converse theorems to be taken up, it is desirable that the wording of the enunciations should at once make the converseness of the theorems evident without the help of the teacher's paraphrase.

In actual teaching I found difficulty in eliciting that the second theorem is the converse of the first, without altering the form of the enunciations. Explaining to my class, therefore, the definition of adjacent angles as given by Mr. Charles Smith—*vide "Euclid's Elements of Geometry,"* by Smith and Bryant (Macmillan)—I re-enunciated the theorems as follows:

1. If the outer arms of two adjacent angles are in a straight line, the angles are supplementary.

2. If two adjacent angles are supplementary, their outer arms are in a straight line. M. D. MANICKAM.

Central High School, Shiyali, S. India.

"Excerpta Brevia."

YOUR reviewer in his note on "Excerpta Brevia," by W. H. S. Jones and R. Parker Smith, remarks the absence of the interleaving spoken of in the preface. May we point out that by special request this book has been brought out in two forms, one interleaved without vocabulary and the other with vocabulary but without interleaving? The former edition was produced to meet the views of those who disapprove of vocabularies in school books, and should also in this form prove very useful as an advanced unseen book.

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THERE is nothing in the preface nor anywhere in the book to suggest that it is being brought out in two forms, but without the vocabulary it will certainly make a very useful unseen book.

THE REVIEWER.

The School World.

A Monthly Magazine of Educational Work and Progress.

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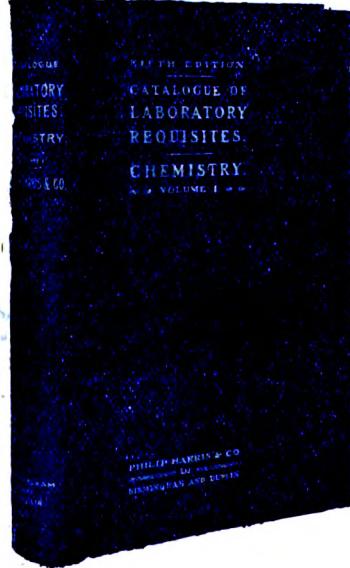
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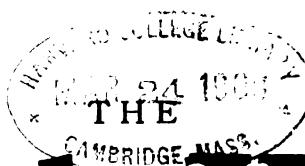
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The School World

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NO. 108.

DECEMBER, 1907.

SIXPENCE.

THE FUNDAMENTALS OF EDUCATION.

By A. E. CRAWLEY, M.A.

Headmaster of Derby School.

EDUCATION is increasingly "on the make." The subject has attained gigantic proportions, and our system, with its organised primary, secondary, tertiary, and university stages, and with its enormous expenditure of both public and private money and public and private work and time, is engrossing more and more interest and attention.

It would doubtless stagger belief if it were proved that, after all, this immense educational structure rests on an unsound foundation, that this traditional yet constantly reformed system, with its laborious or ingenious methods, its densely packed curricula, and its principles developed with so much care and thought, is radically erroneous and destructive of its essential object.

Yet I have no doubt that this dire possibility is capable of proof, and that the psychology of the near future will carry it out. It would not be the first or only case of an erroneous system lasting for ages. The following remarks are intended to suggest the possibility that our educational system is fundamentally unscientific. The suggestion may be formulated thus—that (with such exceptions as, for instance, some of Froebel's ideas) our system has no relation to psychological and biological fact.

When one asks what is the primary end or object of education, the answer is, perhaps, mental development, "culture," "formation of character," "preparation for the business of life," and so on. Putting aside the question as to whether some of these ends are illusory or wrong in themselves, one may say at once that our system fails to carry out any one of them. More than that, it actually produces a perversion of each.

Taking first the biological question, we ought to ensure that a system of education should be in the widest sense biological; that is to say, it should be based on such principles as will carry on the upward development of the race. Our system, however, is confessedly retrogressive, if not pathological; it has in view the past of the previous generation (the parents, the teachers, and the legislators) instead of the future of the race.

In other words, we are trained in the same way as, and always a little better than, our fathers, in the hope that we may be ourselves a little better. In carrying out this aim, the subconscious notion is, to make us more and more mature, to make us more of men, and more rapidly. I do not mean to imply that any precocity is consciously aimed at, or that physical or moral maturity is, even subconsciously, forced. What I mean is, that we set ourselves to produce as mature a mind as possible.

But our aim ought to be the exact opposite of this: we ought to keep the mind and character in the pre-adult stage as long as we can. By pre-adult I mean the period ending with the later period of adolescence, say about seventeen in boys. As for the body, there is such prevailing ignorance of its needs and possibilities, that at present we can only pray, as it were, for light. Education should have two central aims: (1) to keep the whole organism youthful for as long as possible, and (2) to lay a foundation for an increase of youthfulness in future generations. Precisely because the youthful type is the higher. What are the reasons for this apparent paradox? Biologists tell us that after puberty the growth of the human species is in the direction of degeneration and senility; man reverts to the ape. They tell us that the higher man is in the line of evolution, the more he retains of the child-type. "Among the anthropoids," says Ellis, "the infant ape is very much nearer to man than the adult ape. This means that the infant ape is higher in the line of evolution than the adult. Man, in carrying on the line of evolution, started not from some adult male simian, but from the infant ape. The human infant bears precisely the same relation to his species as the simian infant bears to his, and we are bound to conclude that his relation to the future evolution of the race is similar. By some strange confusion of thought we always assume that the adult form is more highly developed than the infantile form." The same is true of psychical development. The child of many savage races is not less intelligent than the European child, but while, e.g., the African, as he grows up, becomes stupid and obtuse, the European retains something of his childlike lithe ness. "The progress of our race has been a progress in youthfulness." We know that in

geniuses there is a more or less striking approximation to the child-type, and of the ancient Greeks, who, in the opinion of some, represent the highest point yet reached in human evolution, it was said, " You Greeks are always children."

" Can it be possible," we ask, " that the mind of the child is really the superior? " There is a very fair presumption that such is the case, that in quality and type the pre-adult mind is superior to the adult, just as, in quality and type, the child's body is more highly developed than the adult.

" Mental exaltation," says Clouston, " is perfectly natural in childhood. It is, in fact, the physiological state of the brain at that period. Depression, on the other hand, belongs to maturity, and racially, melancholia is an insanity of the adult and civilised." The memory of a child before it has received any education of the traditional sort is infallible. The child's power of " intuition," and its capacity of going straight to the point are remarkable, though as yet little known. As for imagination, making due allowance for the lack of experience, we must admit that for vividness and power, concrete form and versatility, the mind of the child is far superior to that of the creative artist. The child may be said, more or less, to live in its imagination. No less characteristic is the imperative tendency for an idea to express itself in action. To compare the characteristics of the adult mind is very instructive; one result arrived at is typical—the gradual obsession of the adult mind by abstractions, which never impose, except through education, upon the pre-adult. Even if there were no direct evidence, it would be legitimate to infer by analogy that, if " the savage is at his best intellectually, emotionally, and morally at the dawn of puberty, while when puberty is drawing to a close a degenerative process seems to set in," the same may be true of Europeans.

There is a further point which serves to connect the biological and psychological issues. The discovery of the biological importance of play marked an epoch in the study of man. We are so familiarised with the existence of play as " a childish thing " that we never stop to consider what a remarkable phenomenon it is. Reid remarks : " In reality the play of a child is the most beautiful, the most wonderful, the most suggestive phenomenon in nature "; and he puts the biological law thus : " The higher the animal, the more capable of making physical and mental acquirements, the more sportive it is."

Now if there is one thing which broadly differentiates the child from the adult, it is the passion for play. It is a curious fact, but no coincidence, that the words *σχολή* and *ludus* were used by Greeks and Romans for the training of school. The truth concealed by this fact we have forgotten (if we ever knew it) in the stress of competitive examinations and the accumulation of " learning," yet it is of profound importance. It is this : the brain is not a muscle, and there is every reason to suppose that artificial exercise of

the brain, if it leads to fatigue, arrests its development. Yet hard study is still the ideal virtue for the schoolboy's aspirations. *Improbus labor* is a favourite motto in school books; *Laborare est orare* is carved on school portals. This suggestion is very clearly proved in the case of memory. Refrain from drilling a child's memory, and, other things being equal, the memory never fails. But in school we make children learn and repeat and grope among symbols, and memorise everything up to straining point. Statistics of " mental fatigue " are beginning to be made, but they are as yet considerably under the real figure. The nervous organism of children is most delicate, and all the more easy to tire and spoil. I have no doubt that a very large percentage of minds are practically ruined by this over-pressure. Physical deterioration is an increasing result of this; it is fatigue that leads to juvenile craving for excitement. In Prussia there is a very fair annual average of suicides among school children. Such considerations lead us to make the paradoxical assertion that there should be no work in schools.

In the next place is the fact that " the importance of the brain has been greatly exaggerated. . . . Its importance is strictly related to the brain's very intimate connection with the body generally. We have been apt to regard it as the despotic ruler of the body, whereas, so far as it is a ruler at all, it is a strictly democratic ruler. The brain elements are but sensori-motor delegates brought together for the sake of executive convenience." It is just here that we make the mistake of excessively abstract methods of teaching, and excessively rigorous drill and discipline. The mental organism is not merely the brain, but the whole neuro-muscular system, the delicacy of which in children we adults are too apt to forget. It is probably to fatigue that the lack of individuality and the feebleness of will, so conspicuous in our schools as adolescence is reached, are chiefly due.

But we must add that for purely mental development the true method is not mental drill or abstract reasoning, but action, action in the ordinary sense of the word, and the form it should take is play. How is it that the men who do best in life, and particularly the men who are most in touch with reality, are precisely those who did badly at school? Why do business men complain that the young men who join them cannot think, that is, cannot apply their abstract knowledge to reality? The fact is that the only mental development a boy gets now is in the playing fields and the social life of school! This is not enough, of course, and he has to obtain his real education when he goes out into the world. He is thus doubly handicapped, not to mention the possibility of arrested physical and mental development resulting from his school life.

It may be said that our traditional curriculum, on its literary side, produces " culture." This I deny. Culture is the result of refinement in the conditions of life. It is a rare product, only real in certain temperaments of the artistic order. To attempt to teach it by English literature is as

vain as the older method of the classics. In the latter case we have a curious example of deliberate choice of the abstract. Christian ideas of other-worldness and aristocratic ideas of aloofness from the masses have helped to institute and perpetuate this "gentlemanly education," which has no relation to the reality amid which the gentleman must live.

Again, it is a psychological blunder to aim at the mastery of a subject, or of a stage of a subject. This is "cram" in disguise. Specialising in all departments of human knowledge is necessary for mankind, but it should be done by adults only.

Passing on to further details, we note that the vaguest ideas prevail on the subject of physical and moral culture. There is a tendency which needs checking, towards a muscular training divorced from the training of the senses. This is why cricket or football is so superior to, for instance, gymnastics. We teach nothing, and I suppose we know nothing, of health; we do not even teach our children how to be clean, or how to eat and drink and breathe. It has been remarked that the claim of "formation of character" is an unconscious apology for the educational uselessness of our higher curricula. That is as it may be, but the way in which the character of a public-school boy is "moulded" by his masters is a spectacle for the gods. Tartuffism and pseudo-patriotic sentiment do not tend to produce a high type of character. The moral principles we inculcate have no relation to reality, except as a puritanical hypocrisy. And, generally speaking, one feels inclined to agree with the pregnant remark that "the vilest abortionist is he who attempts to mould a child's character."

As to useless subjects, we have suggested that no subject helps mental development unless it is translated into terms of reality, instead of being abstracted into books—but there are subjects of absolute valuelessness. History in the ordinary sense of the term is one. "History is written that we may get rid of the past": that is the dictum of the greatest living authority on historical science. History of a biological or sociological type, however, is of use towards understanding the world. All languages except the vernacular are to be rejected. As some one has put it, there is little use in "learning to say the Lord's Prayer in many different languages, any one of which the Lord only can understand." "It is a psychological impossibility," says Stanley Hall, "to pass through the apprenticeship stage of learning foreign languages at the age when the vernacular is setting, without crippling it." And the average schoolboy's ignorance of English, as an instrument of speech and thought, is due partly to the attempt to learn other languages at the same time, and partly to the inadequate way in which English is taught. The English language, if properly taught, would have magnificent results in power of thought and expression, but a drilling in pseudo-scientific grammar or in models from the great writers is in the one case deleterious and in the other narcotic. "No man fully

capable of his own language ever masters another." There is no argument of any value for the retention of languages other than English. If it is needed for professional purposes, a boy can learn a language in a few months abroad. This is the only way he ever learns it now, either after leaving school—the four or five years spent there in learning French or German being so much waste—or spending part of his hard-earned holidays in a foreign *pension* by an arrangement between the headmaster and the lodging-house keeper.

A great part of mathematics is useless, and only taught by way of rounding off the subject. There is too much writing. Calligraphy should be taught as drawing is taught, and practised with a view not to shorthand facility but to beauty and use. Subjects of various sorts should be thought out and expressed aloud. Most boys leave school without any power of dealing with a subject, or even "writing it up." Lastly, we need the addition to our curriculum of instruction in the realities of life—we should produce men who are men of their hands, and possessing the insight which can pierce through the veils of cant and other protective armour used in the battle of existence. For instance, no boy is ever actually taught the use and importance of money. By this I do not mean the need of economy, or the prohibition of theft, or "the wise use" of wealth, or, again, the political economy of the books.

I have not stated a case, necessarily, so much as thrown out suggestions; but it seems to me that the mind of the adult, if not bullied, slave-driven, and crammed in childhood, would be a saner, brighter, and more living thing than it is now. I think there can be no doubt of this. There is no lack of facts which point unmistakably to the necessity of a radical change in the principles of education, and when once the necessity is pointed out other evidence will fall into line, and further evidence may soon be forthcoming.

TENURE OF ASSISTANT-MASTERS IN PUBLIC SECONDARY SCHOOLS.

BY the unanimous judgment of the Court of Appeal in the Richmond Grammar School case (*Wright v. Zetland*), the "exceptional" position, in regard to insecurity of tenure, of assistant-masters in public schools under the Public Schools Act, 1868, that is to say, of the great majority of assistant-masters in secondary schools, has been made clear to all.

In giving judgment a few days ago in a case affecting an assistant schoolmistress (*Mansell v. Griffin*), Mr. Justice Phillimore alluded to the Richmond case. He said: "The position of a certificated mistress in a public elementary school was, as regarded the headmaster or headmistress of that school, a more independent position than the position of a master in a public school under the Public Schools Act, 1868, or in a public grammar school under the Endowed Schools Commissioners. Their position had been recently shown

by a case before Mr. Justice Lawrence, whose view was supported by the Court of Appeal. Under the Public Schools Act, 1868, the exceptional position of assistant-masters had been determined. *They were merely the assistants of the headmaster, appointed by him, and dismissed by him at pleasure.*"

After many years of doubt and discussion, the great majority of the members of the most constructive profession find that their tenure of office is exceptionally insecure. They are dismissible at pleasure, that is, at a moment's notice, without cause assigned, at the will of a single person, of whom they are the personal servants. No custom of a term's notice in the profession has any legal force. They may be thoroughly competent and conscientious; they may have given the best of their years to the service of their school; all that need not afford the slightest protection against the whim of an elderly headmaster or the theories of a new broom. Assistant-masters in secondary schools are the only public servants who have no guarantee against arbitrary dismissal at the hands of an individual.

Such is the unenviable position of assistant-masters in secondary schools. The framers of the 1868 Act wished, no doubt, to abolish the free-hold system of tenure in the grammar schools, but they can scarcely have intended to replace it by a system of flagrant injustice.

Of course, if a headmaster can dismiss an assistant at a moment's notice, it follows equally that an assistant can leave at a moment's notice; and if assistants are the personal servants of the headmaster, the latter incurs the liability of all employers for salaries, insurance against accident, reasonable accommodation, and fair treatment. For the sake of the schools it becomes necessary to find a remedy for this impossible state of things.

Fortunately, headmasters, as a body, are fair and reasonable, and the great majority of them would welcome a solution of the problem which would attract the best class of men to their schools. At the present time there is a growing disinclination amongst honour men to enter the teaching profession, and, if things remain as they are, it is fairly safe to prophesy that the judgment of the Court of Appeal will greatly increase that disinclination.

A short time ago, the Incorporated Association of Headmasters and the Incorporated Association of Assistant-masters, acting in agreement, adopted the following resolutions :

(1) That the headmaster shall be empowered as agent of the governing body—

(a) At discretion to appoint assistant-masters.

The headmaster shall notify to the governing body each such appointment, and assistant-masters shall on such appointment hold office from and under the governing body.

(b) At discretion to give notice of dismissal to assistant-masters. The headmaster shall, without delay, notify to the governing body any ex-

ercise of this power; and assistant-masters shall have the right of appeal to the Board of Education against such dismissal; this right to be exercised not later than one month from the receipt of notice.

NOTE.—The words "at discretion" are meant to record that the governing body is in a position to inquire into the mode in which the power has been exercised.

(c) To suspend from attendance assistant-masters for any adequate cause to be judged of by him; but he shall notify forthwith to the governing body such suspension.

- (2) That the decision of the Board of Education in matters of appeal under 1 (b) shall be accepted as final by all the parties concerned, and that, in a case of successful appeal, the assistant-master shall not suffer by loss of salary pending the decision of the Board of Education.
- (3) That each assistant-master on appointment shall agree in writing to the terms of service as set forth according to a form of agreement to be approved by the governing body.

It will be seen that these resolutions give, as is fitting and necessary, the selection of the staff to the headmaster, and that they make the assistant-master the servant of the school. The assistant-master is governed by the headmaster, but has the right of appeal to an impartial tribunal. The resolutions furnish the basis of a just and natural solution of the problem. A short amending Act on the lines of this agreement would at once establish reasonable security of tenure and go far to attract the right men to secondary schools. It should be made retrospective. It is vital to the future of secondary education that the men who teach in secondary schools should not be regarded as the mere assistants of an individual, but as the public servants of the schools.

THE NEW REGULATIONS FOR SECONDARY SCHOOLS.

By H. BOMPAS SMITH, M.A.
Headmaster of King Edward VII. School, Lytham.

THE significance of the new regulations for secondary schools is pointed out in the first two paragraphs of the prefatory memorandum as follows :

They lay down new rules as to the eligibility of secondary schools for public aid in respect of freedom from denominational restrictions or requirements, representative local control, and accessibility to all classes of the people.

They also carry out a further development of the system laid down in the regulations of 1904 [that is, of paying grants on the course of instruction as a whole, instead of on the teaching of special subjects], in which it has now been found possible to allow more elasticity.

This greater elasticity has been unanimously welcomed by all who are concerned with the administration of our secondary schools, as marking a fresh advance in the educational policy of the Board, which has now probably gone as far as is possible under existing conditions in the way of granting freedom of internal organisation.

The prescribed curriculum in which a definite number of hours must be assigned to definite subjects is now no more. The four years' course has been extended. The vexatious restrictions on classification and promotion have been abolished, and there is no longer a temptation to put a boy or girl into a higher form for the sake of earning a larger grant. Originality is to be encouraged by special grants for valuable educational experiments. It is, therefore, all the more to be regretted that the benefits to be derived from this more liberal policy will in many cases be counterbalanced by the effects of the new rules referred to in the first paragraph just quoted.

For our purpose the main conditions to which state-aided schools must now submit may be divided into two classes. There are, in the first place, the conditions relative to the freedom of the schools from denominational requirements and restrictions, and to their control by popularly elected local representatives. These conditions are briefly that the school scheme must not require any member of the teaching staff or a majority of the governing body to belong to any particular denomination, and that the governing body must contain a majority of representative governors appointed by local representative authorities, such as county or borough councils. In the second place, there are the conditions intended to ensure the accessibility of the schools to all classes of the population. With this object it is provided that where a fee is charged, 25 per cent. of the scholars admitted shall normally be children from elementary schools, who upon passing a suitable entrance test will be allowed to attend the secondary school without the payment of any fees.

The former set of conditions appear to be open to objections on two grounds. They attempt to enforce a type of unity which is inappropriate to our existing system of secondary education, and unlikely to further the evolution of the national organisation of education which we all desire; and, secondly, their enforcement involves such drastic changes as seriously to imperil the efficiency of many schools, and indeed of the whole system of state-aided secondary education.

The outstanding feature of our system of secondary education has been its elasticity and variety of type. The public schools, endowed grammar schools, municipal schools, and private schools, all meet different educational demands, and embody traditions which are to some extent distinct. This variety of type has been accompanied in the past by a great lack of co-ordination, and it is universally recognised that one of the chief problems confronting both the Board of Education and the local education authorities in recent years has been the incorporation of the various classes of schools in one coherent system. But such an incorporation can be effected in either of two ways. One type of school organisation may be adopted as the standard to which all others are compelled to conform; or else each type may be developed upon its own characteristic lines to form one element in a comprehensive system. In

its regulations for the constitution of the governing bodies of all state-aided schools the Board has adopted the first of these methods as the one by which our national system is to be established, thus reversing to a large extent its policy in the past.

It is, of course, possible to exaggerate the significance of an alteration in the governing body of a school, but there can be no doubt that in the long run the character of a school is determined by the qualities of its governors. Each type of school has always been administered by a definite type of governing body, and hence the reduction of all governing bodies to one model will have a tendency to produce a certain degree of uniformity of outlook and atmosphere in the schools themselves.

It may be objected that the Board has no desire to render the municipal type of school universal, but simply selects it as the type most deserving of public aid. On this supposition the Board would be attempting to divide the secondary schools of the country into two classes. The one class numbered less than 200 before the issue of the regulations, and, though a most important part of the whole system, does not represent the widest type of culture, yet it is to monopolise all the grants for secondary education, to train all the pupil teachers, and to be the type to which all schools hereafter to be founded must belong if they are to receive public aid. The other class is to be composed of the schools representing other educational traditions, and rich enough to refuse the conditions offered. The present unfortunate division will thus be deepened, and tend more and more to be associated with distinctions of class and wealth. The exceptions which the Board has already found itself obliged to make are a proof that it finds itself unable to carry out such a programme.

But waiving the question of the ultimate tendency of the Board's new policy, it may be still contended that its method of procedure has been unnecessarily violent. The continuity of a school's life cannot be interrupted without serious loss, yet at six weeks' notice 628 schools out of about 800¹ were called upon to alter the constitution of their governing body, involving in many cases an entire reversal of the policy and traditions with which for generations they had been identified. Anyone who has been permitted to know a little of what goes on behind the scenes is aware of the consternation with which the regulations have filled those who are responsible for the conduct of some of the most efficient of the grammar schools. It is also to be feared that a sense of uncertainty has been evoked most detrimental to the mutual confidence which had begun to mark the relations between the Board and the secondary schools.

It is to be regretted that so great an alteration was not preceded by a number of preparatory

¹ These figures are taken from the last report of the Board of Education issued in December, 1906, p. 63. But in the Summary of Figures issued in May, 1907, the state-aided schools are only 600, and 293 schools, to which 23 "may properly be added," are said to be under full public control, instead of about 178, as stated in the report.

changes extending over a series of years, all the more because some local education authorities are not yet ready to assume their new responsibilities. In some instances education committees have shown themselves admirably fitted for their work and well able to control any secondary schools, but this has not always been the case. Committees have often been overburdened with their other duties, and many of their members are not at present qualified for dealing with secondary education. A few years of gradual evolution would have rendered the extension of their powers far more likely to produce satisfactory results.

"One of the points," says the Board's last report, "which demand the most careful and thoughtful treatment is how to provide state-aided secondary education in the degree to which, and at the points at which, it is really needed, and how to ensure free access to it for children of every class according as the individual is intellectually capable of receiving profit from it." The second set of conditions above distinguished must be regarded as the Board's attempt to solve the latter of the two problems here defined.

In May last, of the 104,938 children attending state-aided secondary schools, just over 54 per cent. had previously attended public elementary schools, and of the children who had so attended, over 44 per cent. were paying no fees at the secondary schools.¹ It appears, therefore, that, while the total provision of secondary education may be inadequate, a fair proportion of school places are already filled by children from elementary schools, with or without the payment of fees. The free places have hitherto been provided chiefly in the form of scholarships, granted partly by the local education authorities and partly by the schools themselves. The weak points of the system have been three. In the first place, the scholarships have not always included a maintenance grant large enough to enable really poor children to attend the secondary school, and hence the holders of the scholarships have generally come from comparatively prosperous homes. Secondly, the number of scholarships by which a child of narrow means might be given the opportunity of staying at school beyond the age of sixteen has been very limited.² Thirdly, sufficient care has not always been taken to ensure each child obtaining the special kind of education most appropriate to its needs. There has sometimes been, for instance, a tendency to train second-rate clerks instead of first-rate artisans. During the last year or two much has been done towards making good these defects, and in particular the more enlightened authorities have realised that, if the provision of special educational opportunity is to be effective, it must be carefully adapted to each individual case. Unfortunately, the indiscriminate methods which must inevitably follow the adoption of the new regulations, with their failure to recognise the claims of poverty or special talent,

or to distinguish between different types of secondary education, seem eminently likely to accentuate the shortcomings of the existing conditions without conferring equivalent advantages.

The bearing of the new system of grants upon the finances of the schools cannot be here discussed in detail. Speaking generally, the results will be excellent in the case of municipalised schools, but schools which charge a fee of £10 or £12, and do not provide many scholarships, will be far worse off than they were under the old regulations. "In a large number of cases," says the report,¹ "the school fee charged is too low to provide the requisite means for efficiency, and frequently the large number of scholars maintained has become an undue burden on the foundation." But are not the new regulations calculated directly to increase this evil? The further very important question of the readjustment of the financial relations between the local education authorities and the schools aided by them, which may involve a serious loss to certain schools, is too large to be considered here.

The Board's last report, after dealing with the condition of various classes of schools, sums up the situation in these words: "From these facts respecting the various types of public secondary schools, and by the testimony of all the most competent judges, it is clear that *an improved standard of teaching power* in secondary schools is at the root of all improvements and developments." It is because the Board has allowed other issues to obscure this truth that its regulations appear only too likely to interfere with the normal evolution of our secondary education by leading it to develop along mistaken lines.

THE LONDON DAY TRAINING COLLEGE.

By G. F. DANIELL, B.Sc.

These promises are fair, the parties sure,
And our induction full of prosperous hope.

—K. Hen. IV., Part I.

AS Chancellor of the University of London, the Earl of Rosebery on November 2nd opened the new buildings of the college, founded by the London County Council, for the training of teachers of both sexes for elementary or secondary schools. Before dealing with the ceremony itself, it will be advantageous briefly to review the history of the institution. The inadequacy of the provision for such training was keenly felt by the late London School Board and Technical Education Board, and petitions for increased facilities were presented as far back as the year 1898. Accordingly, in May 1901, the County Council decided to establish an institution, which should be recognised by the Board of Education as a day training college, and should be connected directly with the Senate of the London University, the principal of the college to rank as professor of education in the University.

Work was begun in October 1902, in temporary premises in Clement's Inn, some classes being

¹ Summary of Figures, p. 3.

² Out of 104,938 children in state-aided secondary schools only 2,826 were over 17 in May 1907.

¹ P. 53.

held at the School of Economics. Crowded out from the latter, the college found refuge for a short time in Northampton Institute, classes being held in close proximity to the building and engineering shops. From this far from ideal location a move was made to the Council's pupil-teacher centre, Offord Road, Barnsbury; and there the valuable, unpretentious work of the college was carried on until recently, with results which reflect great credit on the staff, whose work has been greatly hampered by the scattered and unsuitable character of the accommodation.

Great indeed, and welcome, is the contrast afforded by the noble building which has now been provided, at a cost of about £48,000, by the County Council. It was a representative gathering of council and municipal magnates, of educational workers, with the college staff and students, which listened to the opening address of Lord Rosebery, who might be regarded as representing in his own person both the University and the Council. In a speech enlivened by many flashes of wit, he referred to the enormous growth of national education since the first education grant in 1834, quoting the fact that in London alone 1,450 new teachers are wanted annually. Now that this country has educational conscription, compulsion in education for all classes, we require the same training that staff colleges gave to the officers of the Army for the teachers of so vast a host. This was a college of teachers: where were they to find a college of examiners? This nation might be divided into examiners and examinees, and the training of examiners was becoming as important as the training of teachers. He went on to speak in eloquent terms of the moral influence of the teacher, declaring that teachers were responsible for the larrkins and hooligans, as well as for the boys and girls who took the laurels of the universities. Manhood, womanhood, charity, kindness—all these could be taught by the teacher, not in a lesson, but by example and influence. He did not know how the religious question would be dealt with in its political or legislative aspect, but if they sent out sceptical teachers—though they might not have the opportunity of giving a word of religious instruction within their school hours—they were doing the schools, not a benefit, but an injury. Scepticism applied to the tender years of childhood was a corrosive acid, eating at the foundations of character. Teachers could foster in children the seeds of faith, of earnestness, of honesty, of truth, and of a legitimate ambition.

The Mayor of Holborn proposed a vote of thanks to the Council for providing the college, and said that though the great public schools might be content with teachers untrained for their profession, the London County Council had decided that this would not be good enough for the schools under its control. Dr. Sophie Bryant, speaking as chairman of the College Committee, gave an interesting statement of the early difficulties of the college, and of their aspirations for the near future. It was unfortunate that we were not

treated to any speech from the principal of the college, whom most of those present particularly desired to hear.

A handsome pamphlet of sixteen quarto pages was issued to visitors, giving a clear and full account of the history and work of the college with a description of the building. The work of the college aims—to put it briefly—at equipping students for teaching in *any* branch of the profession. The students are: (a) King's scholars, undergraduate or graduate; (b) graduates who devote their whole time for one year to study leading to the Teacher's Diploma of the University of London. The bulk of the students belong to (a). About two-thirds are women, which is a smaller proportion than will meet the annual demand, since not only are more women teachers required, but also the average length of service of women teachers is much shorter than in the case of men. All King's scholars are required by the Board of Education to sign a declaration that they intend to follow the profession of teacher in an "approved" school. By a recent regulation, *secondary schools have been added to the list of types of "approved" schools*. By this pregnant addition we see that, from the year 1908, secondary-school teachers will be trained at the expense of the State and of local authorities, just as is now the case of the elementary-school teacher. Exactly how far-reaching will be the results of this revolutionary regulation, which has been so unobtrusively introduced, it is of course impossible to foretell; but it is obvious that the potentialities of the London Day Training College are greatly widened thereby. In a few years the college will send out annually a hundred men and women, all university graduates, all trained in a college with a splendid material equipment—trained, moreover, by a staff every member of which is not only versed in the *theory* of education, but has already made his or her mark as a successful practitioner of the *art*. This will be a great gain to London schools and their children, and no doubt the benefits will spread far beyond the administrative County of London.

The character of the work as now carried on is mainly influenced by the needs of the elementary schools. In all other training colleges provision is made for teaching the students the academic subjects which form part of the teacher's general education, but within the walls of the London Day Training College only professional subjects will be taught. In the science laboratories, the art department, the manual training room, the gymnasium, the students are taught how to teach science, art, manual work, and calisthenics. With the exception of a few post-graduate students, all are trained in drawing, voice-production, and singing. In future, all students will probably be required to have passed intermediate arts or science before admission. For their first two years they will spend the mornings mainly at university colleges, in preparation for taking the B.A. or B.Sc., and their afternoons mainly at the Training College and practising schools. In their third

year they will complete their post-graduate training.

Excellent provision is made for the social life of the college; the common rooms—with refreshment rooms adjoining—are spacious, well-lighted, and well-furnished. The students are encouraged to join in the games and societies of the particular university colleges which they attend, as it is hoped that by fraternising with men and women destined for other callings their interests will be widened, and a broader view and healthier tone result, than if they were kept too closely in an "educational" atmosphere.

Considerations of space prevent an attempt to describe the building, but it may be said that it is remarkably adapted for its purpose, is admirably lighted, and that the decoration is throughout simple and harmonious. The requirements of nature-study, hygiene, including anthropometry, meteorology, and photography, have been considered. In an American institution, the room of the principal would be in telephonic communication with all parts of the building; but this has been neglected here, as is usual in England. The writer could only find this comparatively trivial flaw when visiting the building in the capacity of captious critic; on the other hand, he found much to admire. He wishes that he had himself been trained twenty years ago in a college where "all the students learn voice-production; they are taught how to use their own voice to the best advantage, partly by lectures and exercises, and partly by criticism of their actual teaching performances. In addition, they are taught to train their pupils' voices, both from the point of view of voice-production and of phonetics."

It only remains to be added that Prof. John Adams is principal, and Dr. T. Percy Nunn and Miss Margaret Punnett are vice-principals, to justify the quotation with which this article began.

CLASS-ROOM PHONETICS.¹

By HARDRESS O'GRADY,

King's College School, Wimbledon Common.

III.

LESSON VIII.—THE NASAL CONSONANTS.

Apparatus.—Chart; chalk—two colours.

TAKING again the English vowels, the fricatives and the plosives, ask where the air escapes, through the nose or through the mouth. Is it possible to make a sound with the passage through the mouth closed by the lips, or by the tongue against the palate?

m. *Military men make many mistakes manœuvring.*

What is the sound at the beginning of the words in this sentence? How is that sound produced? What parts of the mouth are used to produce it? Is there vibration of the chords in it? Where would you place it in the chart? If m is produced and the air is stopped from going through the nose, while the lips are opened vio-

lently, what sound do you get? Place m in its square; underline it. Ask for words to illustrate it.

n. Ask the form to pronounce d, then to divert the air so that it passes through the nose, while the sound becomes continuous and the vibration is maintained. What is the result? (If n is not given, give it.) How is n produced? Under what heading shall we place it? Has it vibration? Ask for a set of words or a sentence to illustrate it? Write up the symbol for it.

η. Is there any continuous sound, with passage of the air through the nose to correspond to g? In the words *ping-pong*, *wrong*, *bringing*, what is the sound with passage of the air through the nose? How is it produced? Is it quite accurate to place it under g? Why or why not? Where shall we place it? Notice the curious form of the symbol. Is the sound vibrated? Can anyone give a sentence to illustrate it?

What are the characteristics of these sounds: m, n, η? What shall we call them? (Go from nose-sounds to the name Nasals.) Are these sounds continuous? What will happen to a man with a bad cold in the head trying to pronounce these sounds? Why does that happen? The following lines from *Punch*, quoted in Eve's "German Grammar," are amusing :

Dever bore bedeath the bood
Shall byrtle boughs edtwide,
Dever bore thy bellow voice
Bake belody with bide.

BLACKBOARD NOTES TO THE NASALS.—Draw a line under the plosives; write the symbols under their respective headings; underline the vibrated sounds.

LESSON IX.

Sounds to be taught : l and r.

Take the sentence *Little Lulu loves limpets*, and get the sound at the beginning of each word. Go through the process of placing it, determining vibration; give the symbol. Then, when the form classifies it as a "tongue and gum" sound, go into greater detail; ask whether the tongue touches at more than one point and where; fix the position carefully. Where does the air escape? Much care is needed, as it will be necessary at a later period to distinguish between the French and German and the English l, which Prof. Rippmann in his book, "Sounds of Spoken English" (Dent), calls the dark l.

It will probably be remarked by some member of the form that this sound is really a fricative, the air rubbing out past the two sides of the tongue. It is, however, best to keep the sound by itself. State the reasons for this.

Give the same sentence as used for illustrating i, *Round and round the rugged rock*, &c., trilling the r, instead of rubbing it; give such words as *india-rubber*, or, better still, pronounce a sentence as a South Irishman would, trilling the r. Then pronounce the same words and sentences with the fricative r, and ask for the difference in production. After determining the presence of vibration of the chords, giving the symbol and placing the

¹ Articles I. and II appeared respectively in the October and November, 1907, issues.

sound in its proper square in the chart, point out that to pronounce it correctly the tongue must be well forward, and must struggle with the escaping air. The sides of the tongue entirely close the mouth; the air should escape past the tip only, while the tip should alternately keep yielding to and stopping the air, thus beating against the gums. Ask whether many English people pronounce this sound.

GENERAL SURVEY OF THE ENGLISH CONSONANTS.—Hang up a chart of the English consonants, such as Messrs. Blackie publish, or Vietor's, and go carefully through the sounds. Then put away the chart and write up the consonant symbols in any order, testing each individual's knowledge. Any faulty production must at once be stopped and amended. Then dictate sounds to the form. As the vowels have now been done, whole words and sentences should be given. Train the pupils, first, to listen; secondly, to break up the words into sounds, counting them; thirdly, to write down the words sound by sound. In marking such work, I make each *sound* wrong a mistake, and not merely each *word*. The numbers, the names of pupils, nursery rhymes, or well-worn limericks, make good material for practice. If greater extension is thought profitable, Prof. Rippmann's book will provide quaint and interesting ear-tests.

LESSON X.

THE FRENCH VOWELS.—I have tried two methods of taking these lessons; in the first, I proceeded in the order observed above, finishing vowels and consonants of the English language, and then tackling the foreign sounds; in the second, I took the French or German vowels immediately after the English vowels, the consonants after the English consonants. The last is the more successful, though for the purpose of publication it was more convenient to follow the first method. The advantages of taking the foreign vowels immediately after the English are these: Generally speaking, few periods are allotted to a foreign language; these periods are often ill-distributed, and a form may well ask, where lesson after lesson is spent on the English vowels, when they are coming to the foreign language. Again, taking the groups of sounds together at once brings out the similarity and the differences better than if some time had elapsed between the teaching of the groups. The method is the same, whichever order is followed.

Apparatus.—The Lloyd diagrams; coloured chalks as used for the English vowels.

Write up, in proper order of tongue position and in the colours determined upon, the English vowels. Then direct the attention of the form to the fact that certain of these vowels do not exist in French; rub out *i*, *u*, *æ*, and *ʌ*. Tell the form that the French language, however, contains certain sounds not found in English. Give a sentence in which the sound *y* occurs. Such sentences will be found in Mr. Dumville's excellent

book on French pronunciation (Dent). I borrow at random the following: *Tu eus plus d'une culbute.*

Ask what sound there is in the sentence which they have not in English. Take the chalks of the colours allotted to *i* and *u*, and write next to *i*, on the inside, the symbol *y*, half of the one colour, half of the other. Pronounce the sound again, and ask for what reason the class thinks you have done so. If no satisfactory answer is given, point out that the tongue position of *y* is that of *i*, but the lip-rounding is that of *u*. Point out that for each vowel so far there has been a different tongue and lip position from that of any other vowel; now, however, you have a sound with the positions of two other sounds. Take as an exercise *i-y-u*, *u-y-i*, and for blackboard illustrations I recommend the use of Mr. Dumville's diagrams to illustrate the movement of the tongue from *y* to *u*, that of the lips from *i* to *y*. This sound has always needed much practice in my experience, the English tendency being to let the tongue slip back to *u*, or half-way to *u*.

o. Take another of Mr. Dumville's examples:

Monsieur veut deux œufs (*msjø vœ dœz œ*), and ask the form if they notice any un-English sound in it. Treat *œ* in exactly the same way as *y*, writing it up next to *e* for tongue position, and drawing the attention of the pupils to the lip-rounding. Ask them what other vowel has that lip-rounding. Write *œ* in the two colours of *e* and *o*.

œ. Ask if anyone can produce experimentally a vowel sound with the tongue position of *ɛ* and the lip-rounding of *ɔ*. With a little patience œ should be given correctly. Write it up in the two colours of *ɛ* and *ɔ*, and give examples of the sound in French words; Mr. Dumville gives us: *Leur cœur demeure jeune.*

LESSON XI.

THE FRENCH NASAL VOWELS.—Sounds to be taught, *ɛ̄*, *ã*, *ɔ̄*, *œ̄*.

Tell the form that you have still four French sounds to deal with, sounds which occur practically only in French. Revert to the fact noticed that the air can pass out either through nose or mouth or through both. Ask if anyone can produce a different sound from *ɛ*, keeping the lips and tongue in the same position as in *ɛ*, only letting *some* of the air escape through the nose. If no successful result ensues, read them the following, and ask them what vowel sounds in the poem they have not yet had:

*Le hibou parmi les décombres
Hurle et décembre va finir
Et le dououreux souvenir
Sur ton cœur jette encore ses ombres.*

Or say several times *Un bon vin blanc.*

(Note.—Exaggerate both nasalisation and vibration of the nasal vowels.)

Take the simple vowels *ɛ*, *a*, *ɔ*, *œ*, and tell the class that from these may be produced the French *ɛ̄*, *ã*, *ɔ̄*, *œ̄*, by forcing some of the air through the nose. Make the class practise the following exercise. Without making any sound at all, breathe alternately through nose and mouth, then breathe through both

together. If possible, get each pupil to become conscious of the muscular movement of the uvula. Lastly, when each one says he can manage both intake and expiration using both nose and mouth together, ask the pupils to place their lips and tongue in the position of ε, and, sounding, to breathe out through nose and mouth simultaneously.

Do this with α, ɔ, and œ. Write up one below the other the mouth-vowels; then draw in red the mark over the symbols to show the nasalisation, ē, û, ɔ, œ.

LESSON XII.

THE GERMAN VOWELS.—Write up the English vowels, and rub out æ, ɑ and ʌ, pointing out that these do not exist in German.

Treat y, ʊ, and œ as in French. The following sentences may prove useful, though teachers will probably provide better examples:

y. *Im Frühling blühen die Blüten.*

ʊ. *Goethe's Lieder sind schön.*

œ. *Dem Mörder gönnen die Götter keine Gnade.*

Point out that ʊ is always long, and œ always short. General remarks on French and German y, ʊ, œ.

Practise i, y, u; e, ʊ, o; ε, œ, ɔ; make the class give the tongue and lip position of i, e, œ; then form the "mixed" sounds, keeping the tongue rigidly at the same position, round the lips, to the position of u, o, and ɔ.

Practise also i, e, ε; y, ʊ, œ; u, o, ɔ.

LESSON XIII.

THE FRENCH CONSONANTS.—Draw on the board the chart of the English consonants, and rub out θ, ð, h, and ɳ, pointing out that these do not exist in French.

j. Point now to the place occupied by ɳ, and say that there is another nasal French sound produced very near ɳ in the mouth. Ask the form to ridge up the tongue as when producing ɳ, and then to ridge it up more forward along the palate, thus taking up a position in front of that occupied in the production of ɳ.

Give the following example (from Mr. Dumville's book), *Le seigneur a daigné épargner les vignes des Espagnols.* Make the class repeat. Watch carefully for any substitution of nj for j. (Mr. Dumville has a page on the correct production of this sound.) Write up the symbol under front palate and tongue; determine vibration.

q. Direct the attention of the form to the fact that several of the vowel and consonant sounds are closely connected. Thus, in French what consonant sound is taken very near to u? What consonant is produced very near to i? Pronounce ui, wi, ui, wi; ia, ja, ja, ia. Ask them to pronounce y, and then narrow the lips together still more. When q is given, get by questions the positions and vibration, and place the sound in the chart. Give the exercise yi, qi, yi, qi. Mr. Dumville gives us *La lune huit depuis huit nuits.* He also calls the sounds w, j, and q half-vowels.

FRENCH 1.—It is questionable whether, in such elementary lessons as these are meant to be, one ought to go into the details of the differences between French 1 and English 1; it may be sufficient to insist on the blade of the tongue being

much more forward in the mouth in French 1. If this does not give the required result, the careful paragraph in Mr. Dumville's book will be of great use.

R. Uvular R I do not teach until much later, if at all.

LESSON XIV.

General revision of the French sounds. Write up a series of words containing the sounds which exist in French and not in English. Test by reading them and by dictation of French words.

LESSON XV.

THE GERMAN CONSONANTS, ç, χ and ?.—Draw on the board the complete chart of the English consonants. Then rub out deliberately θ, ð, showing that they do not exist in German and pointing out that Germans, without phonetic training, pronounce, when speaking English, the corresponding plosives t, d.

ç. Ask the form to produce the first sound in *yacht*. Is it vibrated? Try now to produce a sound with the tongue in the same position as that of j, but without vibration. Some practice will give a pure ç. Give the sign for ç, place it next to j, then write up a series of German words in phonetic script to illustrate this sound. There is always a strong tendency for an English boy to pronounce ſ instead of ç. Take the two sounds and compare them. Give on the board such pairs as kırçə, kirſə; then set the oral exercises j, ç; j, ç; j, ç; j, ç; j, ç; and ſ, ç; ſ, ç; ſ, ç.

χ. Call the attention of the class to the pronunciation of the Scottish *loch*, and point out that the sound exists in German. Produce it and ask them whether it is a fricative, plosive, nasal, or like l or r; whether it is vibrated or not. Now ask them to place their tongues almost in the position for plosive k, but instead of closing the air passage by pressing the tongue against the palate, to let the air rub hard between tongue and palate. I have found χ given with ease by this means. Give the symbol, and ask where it shall be placed. Give sentences such as *Mach' auch dein Buch zu.* Practise k, χ; k, χ; k, χ; and u, χ, ɔ, χ, a, χ. Point out that one always gets ç after i, ɪ, e, ε, y, ʊ, œ, and χ after u, ɑ, ɔ. Ask the reason why.

? This is a most difficult sound both to teach initially and to get used in practice. Try the following method first: ask the form to produce h, and ask where it was decided the sound was taken. Now by patience and practice try to get every pupil to open and close the glottis at will. This may be done at first by producing pairs of vibrated and unvibrated sounds, centring the attention on the movement in the throat, then setting the vocal organs in the position necessary to produce (a) the vibrated sounds; (b) the unvibrated, but without making any sound. Next try to close and open the glottis suddenly. After a time the glottal stop should be given, with a quite clear, unmistakable click. It may be interesting here to point out the affinity of the cough, the clearing of the throat, and the glottal stop, and the reasons for them. The sentence *es ist um eine Uhr*, given (a) with voice, (b) through the whispering

glottis, will admirably exemplify the use of the glottal stop before words beginning with vowels in German.

LESSON XVI.

GENERAL REVISION OF THE GERMAN SOUNDS.—Dictate German words and sentences containing sounds existing in German but not in English. Give a reading test.

LESSON XVII.

THE CHANGE FROM PHONETIC TO ORDINARY SCRIPT.—I am not one of those who affirm there is no difficulty to be experienced here. I have found the change to be an extremely delicate operation, and adopted a coloured chalk for phonetic script as against white for ordinary spelling in order to obviate the chances of confusion. The first step with myself is to take some ten, fifteen, or twenty lessons of the book to be used in phonetic script first, and to do those lessons backwards and forwards until they are outwardly and inwardly known. The first twenty numerals I take also. Then I write up the letter in phonetic with the ordinary script against each; next, I take the lessons one by one with phonetic and ordinary script, reserving one side of a very big blackboard for the purpose of orthoepy, each symbol being given with the letter or letters which go to make it up in French and German, as in French u—ou; e—ain, ein, aim, eim, in, (i)en. This is a laborious process, and must be interspersed with questions round the form and devices for maintaining interest. Mr. Cloutesley Brereton suggests teaching a song or a poem and writing up the phonetic version next to the ordinary orthography. But it is from Miss Dale's system of key-words that the best method is to come. I have urged her to help modern language teachers by publishing a little book. I am unable in these articles to describe the details of her method or my suggested adaptation of it. A combination of the methods suggested above, together with division of foreign words into the letters or letter groups representing separate sounds, such as gut, g-u-t; schauen, sch-a-u-e-n; Charles, Ch-a-r-l-(es) (the brackets to enclose unpronounced letters); bien, b-i-en; maison, m-ai-s-o-n, will give satisfactory results.

REVISED VIEWS IN HISTORY.¹

By A. J. EVANS, M.A.

III.

FIYE or six European Powers face the Atlantic—Spain, Portugal, France, the Netherlands, and the Scandinavian States. In the race to India, Portugal won *via* the Cape of Good Hope. Spain, trying westward, stumbled instead on a barrier, which at first she thought was the goal, but afterwards discovered to be America. Portugal got Brazil; Spain claimed the rest. The Netherlands revolted against Spain, and plundered her in the west, and, while Portugal was held by

Spain (1580–1640), in the east as well. The ten southern provinces were reconquered, and became the "Spanish" Netherlands; the seven northern made good their independence, and "held the gorgeous East in fee" besides settling New Amsterdam. The Scandinavian States did little. The day of Denmark-Norway had apparently long passed away, and Sweden was absorbed in religious and dynastic wars with Poland. But France and England began feeling westward in the sixteenth century, and in the seventeenth began to colonise.

While Spain was the common enemy, England and the United Netherlands were friends, though not very hearty friends. They did not love one another in the East. But when, in 1648, Spain finally acknowledged the independence of the United Netherlands and Portugal, England and "Holland" fell out, and, neglecting the growing power of France, fought three wars about colonies and commerce. England won. Then the two realised that France was the champion of herself and Rome; they drew together, dynastically (two Williams married two Marys) and otherwise, and William III. united them in a personal union. The war begun by William against France proved for us to be a second century-war, out of which the Netherlands gradually fell, from weakness.

Note the similarities between our two long wars with France. Edward III. still held what was left of the south-west of France that had been brought to the Angevins by Eleanor of Aquitaine, and the war was waged to maintain the connection between Bordeaux and Bristol, which were engaged in a mutually profitable trade in wine and wool, as well as to support the manufacturers of wool in the Low Countries. Seventeenth- and eighteenth-century England and France had colonies in America, which were used, like all colonies of that time, to provide an exclusive market for the produce of the home countries. Control of the sea gave easy access to Continental France in the Middle Ages. The same control was necessary to be able to attack American France in the eighteenth century. In the Middle Ages we tried to find allies in the Empire, *i.e.*, Germany. Was not Edward III. vicar-général of the Empire? Did not the Emperor Sigismund make a treaty at Canterbury with Henry V.? In the later war we were always fortunate whenever France tried to conduct war in Germany as well as on the sea with Great Britain. But in the Middle Ages the ruling forces were on the side of France. Nationality was too strong for the absentee claimant to Aquitaine or Normandy, and after the weary raids of Edward III. and his son, the incompetence of Richard II., the wanton victories of Henry V., and the miserable failure of Henry VI., France at last attained peace and unity under a strong monarchy. In the eighteenth century France attempted too much. She could not fight Germany, even disunited, at the same time as Great Britain, and the victory of Great Britain in America was complete. There are other explanations, therefore, of the results of these wars than

¹ Articles I. and II. appeared respectively in the October and November, 1907, issues.

the popular notion that one Englishman is equal to α Frenchmen.

It is best to regard these wars from the point of view of France. Thus, we shall find, besides the wars of William III., of Anne, of the Austrian Succession, the Seven Years' War, the War of the American Revolution, and the wars of the French Revolution and of Napoleon, that there was another war, that of the Polish Election (1733-8), in which Great Britain did not take part, and which is therefore omitted in most of our text-books. It was the war by which France finally gained Lorraine, and by which Great Britain lost the goodwill of her old ally, the Habsburg of Austria. But what did they fight each other for? Southey professed he did not know ("Battle of Blenheim"); Swift, in "Gulliver," compares the cause of dispute to a controversy as to which end of an egg should be broken. The opposition party throughout the century said the wars were all on account of Hanover. Our text-books tell us much about the fighting in the Netherlands and in Germany, but little, if anything, about the contest in America, at any rate before the middle of the century. In Marlborough's wars, e.g., the events are Blenheim, Oudenarde, Ramilles, Malplaquet, and, if anything else, Gibraltar and Barcelona. Only the terms of the Treaty of Utrecht introduce Nova Scotia, Hudson's Bay, &c. Yet our books neither explain nor apologise for the omission. How unreal, nay, how "weary, stale, flat and unprofitable," the whole story is! Whether in the international history or the constitutional, everything seems to end at 1688. At any rate, what comes after has no apparent meaning.

But, if we turn to Bancroft's "History of the United States," we find a continuous story, in which the "War of the Spanish Succession" is the heading of a chapter. We begin to realise that *something* happened in North America between the landing of the "Pilgrim Fathers" (1620) and the "revolt of the American Colonies" (1776). And if we follow up the clue, we find that, increasingly as the years went on, the war is not so much between European France and England as between American France and England. It is true that William III.'s war was to maintain himself on the English throne, and that it was, therefore, a war of the Protestant succession, that Anne's war was occasioned by Louis XIV.'s proclamation of "James III.," and was therefore but a sequel. But the "45" was but a by-product of the war "of the Austrian Succession," and in the next war Choiseul, the French Minister, being approached by the Stuarts, replied that he would have nothing to do with religious questions. So the Stuart question faded away. But, as we have said, the war of the Spanish Succession was an American war, both north and south. The war "of the Austrian Succession," so far as Great Britain was concerned, began with a quarrel in the Spanish seas; the interval of "peace," 1748-56, was filled with quarrels in America and India; and after that, even the poorest text-book knows of Clive and Wolfe.

The wars of 1792-1815 were also wars for dominion of the seas and what could be reached in that direction, but to prove that in detail would take us too far. Two points only remain. First, in the two wars which France waged with only one enemy (Polish Election: only Austria; and American Revolution: only Great Britain) she won. Only when we or our German friends were helping one another could we check or defeat her. Secondly, our allies varied, and we were enthusiastic for each in turn, so enthusiastic, indeed, that the opposition, whose opinion we have always taken, believed, or affected to believe, in the enthusiasm, and complained that we were sacrificing ourselves! We were neither such fools nor so enthusiastic. We would help anyone who was our enemy's enemy, so far and no farther, and we had a trick, when we were tired of the fighting, of leaving them in the lurch. What did Austria think of us in 1713, and Prussia in 1763? A counsel of perfection would be, no doubt, to study European history to find the why and how of this German policy of France, and especially to help us through the maze of wars of 1739-48. But for that we have no time, not, at any rate, until European history shall be a class subject, as it is in every country but this.

What was the effect on our constitution of this long period of war arising out of our "bloodless" Protestant "revolution," and of our desire for expansion? For, *pace* our Whig guides, there were changes in the constitution, and the method of governing this country is not the same as it was in 1689. First, it necessitated a succession of foreign Kings. We had a Dutchman, and then, after Anne (who, however Stuart she was, dared not restore her brother, and for a long while had to continue the war against him and his friends), two Germans. William III.'s position is unique among our sovereigns. He was the most "constitutional" King we have ever had. The union between him and the nation, as represented in Parliament, was based purely on mutual interest. He used his constitutional powers to the full, "vetoed" Bills, "influenced" the members of Parliament, chose his own Ministers, found himself forced to employ only Whigs, and was his own Foreign Minister. The Parliament, varying according to the results of triennial general elections, which in turn varied with the moods of the "people," which again depended on William's success on the battlefield or the danger from the "Tenderer," would, and then would not, work heartily with him. They behaved perfectly "correctly" to one another, but there was no love lost between them. Two documents mark the reign, both fondly regarded as "fundamental" laws, on which our "liberties" are (wrongly) supposed to be based. The "Bill of Rights" records what we disliked in James II., the "Act of Settlement" what we disliked in William III. The former has been allowed to stand, as it is harmless. Much of the latter had to be repealed or modified before many years had passed.

Secondly, the two parties which had begun perhaps in 1641, and had got names in 1681, became slowly defined. The process may be regarded as complete at the beginning of George I.'s reign. The Whigs were the more zealously Protestant party, and their allies were the Protestant dissenters. They were therefore in favour of the war and of the Toleration Act of 1689, and on the whole they prevailed until 1710-11, when their folly in prosecuting Sacheverell made their Church policy unpopular at home, and the death of the Emperor Joseph made their war policy impossible abroad. The Tories were the less zealously Protestant party; they disliked William as a foreigner, objected to the war and the Toleration Act, and in 1710-11 passed Acts against the Protestant dissenters and brought about the Peace of Utrecht. The death of Anne caused their ruin, and the failures of the "15" and the "45" only proved that original Toryism was dead. Thirdly, the definition of the parties brought the necessity of homogeneity in the group of the King's Ministers, and this resulted in the existence of a "Cabinet," or secret meeting of the chiefs of departments. It was in vain that the Act of Settlement legislated against the new institution; it was completed when George I. came to the throne, and the Whigs, taking advantage of his ignorance of English affairs, established themselves firmly in power.

Other results of the war were the Parliamentary Union with Scotland, which put an end to the kingdoms of England and Scotland, and inaugurated the Kingdom of Great Britain (1707), and the establishment of the Bank of England in order to manage another consequence of the war, the National Debt.

Finally, the commercial classes and the land-owners now having gained a permanent place in the constitution for their representative, the House of Commons, a new era was introduced in the relationships between the mother country and the colonies, and the long friction began which ended at last in the partition of the British Empire in 1783. Penal laws were multiplied in protection of property, until there were more persons hanged in a single year of George III.'s reign for petty theft than had suffered for religion under "bloody" Queen Mary.

Walpole is the typical product of this period of Whig supremacy. He is the King's Minister, but he depends on the House of Commons, which, however, he can "influence" until the clamour of London merchants and the discontent of jealous colleagues drive him from office in 1742. His position is best understood by consideration of the position of the Chancellor in the present German Empire. He did not say "All men have their price," nor did he inaugurate the use of "bribery." He protested against being called a "Prime" Minister.

We have said that old Toryism died at Culloden. We might add that old Whiggism died there too. The dynastic struggle into which the religious quarrel had developed was ended, and

neither "Whig" nor "Tory" had any meaning. "Whigs" were merely those who were in, "Tories" those who were out. George II. could not free himself from the tyranny of the Whig nobles, but his grandson did. Trained in Bolingbroke's principles of "patriotism" (none for a party, all for the State) he succeeded, after ten years of struggle, in re-establishing "personal government." His party got the derelict name of "Tory," which was thus utterly changed in meaning. Unfortunately, George III.'s Ministers were not geniuses in statesmanship, and the great conflict which occupied the first part of his reign, that with the American colonies, was a failure. It was scarcely his fault. His policy was popular at home, and was supported by many in the colonies. The disruption must be attributed to the vigour of certain leaders on the American side, to a series of military blunders on the British side, to the help afforded to the colonists by France, but, above all, to the breadth of the Atlantic and of the *hinterland* of the colonies. It did no more than shake George III.'s rule, for after two stormy years the Whigs failed once more against the King's opposition, and partly owing to certain "economic" reforms which were effected in those two years, partly to the purity of the younger Pitt's administration, and partly to the unanimity with which the nation entered into the war with France, the new Toryism triumphed and held the field until 1832.

How slowly our modern constitution came into existence may be realised from two facts. Pitt's premiership was regarded as a "novelty" by the Portland Whigs in 1797, i.e., they regarded it as "unconstitutional." The Whig Ministers of 1806 denied that they formed a "Cabinet." When was the first Cabinet? and when the first Prime Minister? It is exceedingly difficult to say. Both were unknown to our Statute Book until a very few years ago.

Meanwhile, alongside of the Britain which was fairly well represented by the House of Lords and Commons, there had grown up a new England. There had been a revolution in agriculture and industry. The old system of common fields had passed away, and hundreds of enclosure Acts had legalised the change which gave us our hedge-rows. The uses of steam had been discovered, and many new processes in spinning and weaving had brought in the era of factory towns. All this was engineered by a rising middle class. While the war lasted, the nation was satisfied with being, but when the rising of the nations had swept away Napoleon, there was throughout Europe an expectation of change in systems of government. This was the opportunity for the English Whigs, who had been out of office almost continuously for fifty years. In the face of this new phenomenon, the old struggle between Tory and Whig had ceased to be of importance. It was not an improvement of the old system that was wanted, nor a removal of some of its more glaring anomalies. It was the introduction of the new middle class into the old constitution

that was seen to be necessary, if Government in this country was to have a stable basis. Naturally, the need was not obvious at first sight to those who were in possession, and the Tories were divided into two kinds, those opposed to all change, like Eldon and Wellington, and those who would modify social conditions, improve systems of taxation, and even make moderate changes in the constitution. Such were Huskisson, Canning, and Peel. The inevitable struggle roused passion, and it was out of this passionate struggle that the Whig theory arose, which, through Hallam and Macaulay, has coloured all our text-books. It was so great a revolution that was intended that it was necessary to prove that the Tories were all wrong, the Whigs all right; and as Englishmen always believe that their particular party is the *true* conservative that is based on the old constitution, it was necessary to show that the present system was a perversion of the "golden ages." Hence the belief that the "Revolution of 1688," so "legal" and so "bloodless," had introduced the "true" constitution from which the Tories (not, of course, the Whigs—their oligarchy was forgotten) had departed, to the prejudice of "true liberty" and the "rights of the people."

It was ever so in our history. Under the Normans we asked for "the laws of Edward the Confessor"; against John we appealed to the charter of Henry I. When, in 1297, the newly born States General revolted against Edward I., it was as a "confirmation of charters" that they got practical control of taxation. Henry VIII. justified our greatest revolution by alleging that it was "by divers and sundry old authentick histories and chronicles, manifestly declared that this Realm of England is an Empire, and so hath been accepted in the world." The Church of England believes that it is based on the first four centuries of Christendom. The Stuart Kings based their action on Tudor precedents; their opponents appealed, on the contrary, to Plantagenet and Lancastrian custom. The Whigs of 1688 went farthest back of all, and laid it down that James II. had "endeavoured to subvert the constitution of this kingdom by breaking the original contract between King and people," and had "violated the fundamental laws." We need not wonder, therefore, that the Whigs of 1832 should also believe that the Tories were wickedly trying to prevent what was so obviously right.

But it was a revolution that happened in 1832, quite as much as the almost contemporary revolution in France. There the middle classes had exploited the desires of the "people" to establish a "middle-class" kingship. Here, too, in fear of what might happen if all change were refused, in fear, too, of actual rioting and possible civil war, the King was compelled by the Ministers to threaten to "swamp" the House of Lords, and so compel them to assent to a revolution which finally put an end to the control of both. In 1834 William IV. thought he could still change his Ministers at his own discretion. The next

General Election showed him that the new electors were not amenable to the "influence" that the Crown had exercised over the old.

We have gone through another revolution since then. We have admitted to the constitution practically all the manhood of the nation, and the more recently admitted are just beginning to realise their power. They have completely turned their backs on the Whig theories of a century ago. They believe neither in the middle-class monopoly of power nor in the individualism which Bentham taught and the Liberals practised. We can therefore now see that Hallam and Macaulay are no more infallible than other deities of the past, and we can, at any rate, write our history down to 1832 with more impartiality than they. Later than that, it is not easy to go. And as we have as yet no dominating school of quite modern history, it is unnecessary to revise any more views.

THE PROBLEM OF MORAL INSTRUCTION.¹

PERHAPS the child's greatest enemy is the adult, and if not the most dangerous form of adult, certainly the most tiresome, is the adult who will insist on pointing the moral of his stories. When these moral-pointing adults bind themselves together into a league and try to "noblise" the education authorities; when they are bold to say that their plan will deliver us from all our religious squabbles by delivering us from all necessity for religious instruction, it is time to speak out clearly. Mr. Major's books are as unimpeachable as Mr. Pecksniff, but a child after working through all these stages would probably feel much as if he had enjoyed for three years continuously the society of Mr. Pecksniff; if he escaped this fate, it would not be the fault of the system, or the books, but of the teacher. If there must be direct moral instruction, the book by Miss F. H. Ellis is vastly to be preferred, for the simple reason that it is the outcome of practical experience, and she has taken pains to get her moral "thought" for the week worked out, as far as possible, not only in her moral lesson, but in the Scripture, the literature, the history, the manual work, and even the games. The moral lesson is not a separate subject: it runs through all. But, even here, there has had to be a good deal of stretching to make things fit; e.g., the "thought" is courage; Grace Darling and

¹ "Character Forming in School." By F. H. Ellis. (Longmans.) 2s. "Healthy Boyhood." By A. Trewby, with Introduction by Sir Dice Duckworth, and Foreword by Earl Roberts. (From the Author, Fenton House, Hampstead Heath.) 1s. 6d.

"Moral Instruction." By H. Major. Junior, Middle, and Senior Stages. (Blackie.) 1s. net each. "A Scheme of Moral Instruction." By Canon E. R. Bernard. (John Davis.) 6d.

"The Bible Story." By Helen N. Lawson. (Macmillan.) 2s. 6d.

"Old Testament History." By Rev. T. Nicklin. Part II. (Black.) 2s. "Bible Lessons for Schools: Genesis." By E. M. Knox. (Macmillan.) 1s. 6d.

"Readings in Old Testament History." By Rev. A. R. Whigham. (Rivingtons.) 2s. 6d.

"Scripture and Truth." By the late Benjamin Jowett. Reprinted with Introduction by Lewis Campbell. (Clarendon Press.) 2s. 6d. net.

"The Book of Esther." By Dr. A. W. Treane. (Pitt Press.) 1s. 6d.

"The First Book of Kings." By Dr. A. E. Rubie. (Methuen.) 2s.

David and Goliath are the stories that illustrate; this one can follow, but when the daffodil is next introduced as "Nature's warrior flower," because it has sword-like leaves and a trumpet-shaped flower, one feels that either this is forced or else William Wordsworth must be rewritten. Was it a war-dance, when his heart filled with fancy and danced with the daffodils? In spite of this, if one is going to attempt moral instruction, Miss Ellis's book is better than any we have yet seen. Canon Bernard's little manual is carefully done, but it presumes all through a previous knowledge of the Bible story in the children, and what one usually finds in real life is the most amazing ignorance of the most familiar Bible figures and scenes.

What these incurable adults are in danger of forgetting is that moral goodness is not so much taught by moralising as caught by contagion; moral education is not so much preaching morals at children as living morals with them. Goodness cannot be plastered on in patches, or applied in spots like a poultice. Telling is not teaching. The moral instructionist has no faith in anybody but himself; unless he points the moral, he doesn't believe there is any moral effect. The teacher, on the other hand, trusts the child to form its own conclusions; he has the quiet faith of the husbandman who is content to await the result of slow, inward, and unseen growth. The best teacher is the teacher who holds up the picture and lets the image do its own work in the inner being, who refuses to rob the child of his own original view of things, and has faith that the child's heart-need, as Froebel calls it, will find its own best nutriment. All story is moral; every child that hears a story has its own moral thought on the subject; to force our adult views upon it only confuses and retards the growth of its own mind.

Mr. Trewby speaks straight, simple words to boys on the subject of self-abuse. We cannot agree with his alarmist estimate as to the number of boys who practise this vice, though he quotes eminent authorities. To put it at over ninety per cent. is absurd exaggeration. But the evil is serious enough, and both parents and teachers are wickedly silent on a subject which is really a matter of life and death. To such as wish to do their duty in the matter, this little book should be helpful.

To turn to the books on the Bible, it is a happy thought to reprint those essays in which Jowett did for the Bible in the nineteenth century what Colet and Erasmus did for it in the sixteenth. The tendency to edification has obscured the actual message of the Book in much the same way as the tendency to scholasticism; both are "textarian," though in different senses of the word.

Mr. Nicklin completes his Old Testament history for sixth-form boys. It is a sound and scholarly piece of work, with maps and illustrations that illustrate. For junior forms those books are best which allow the Bible to tell its story in its own way and in its own words. In

this respect Miss Lawson's book is much the best of those that lie before us, though she makes the mistake of mixing in the New Testament with the Old (thus disqualifying her book for use in schools attended by Jewish children), and we cannot congratulate her on the picture of Abraham entering the promised Land of Canaan; there is still need of a pre-Raphaelite school. Miss Knox is far too fond of pointing the moral. "The great lesson of Sodom and Gomorrah is that we cannot serve God and mammon," (Joseph) "giving bread to dying nations as Christ gave to the world the Bread of Life": such things as this are utterly beside the mark—mere ballast; but they please the adult mind. Mr. Whiphams book is open to the same criticism: Noah's ark is a type of the Church, and we have two quotations from the Baptismal service. Either this sort of thing produces no effect at all (like the quotation from Paracelsus), or else its fosters a perverted notion of the Bible story.

Both the commentaries which lie before us contain sound work. Dr. Rubie's book is a good one for local examination purposes. Dr. Treane's "Esther" is for more advanced scholars; it is scholarly, frank, and up to date. Perhaps it was the "heathenish naughtiness," as Luther called it, of his author which caused such a sentence as this: "In this section we are shown the strange concatenation of apparently trivial circumstances which collectively have the effect of bestowing the highest reward and most signal disgrace upon the humble and virtuous Israelite and the highly placed enemy of that people." Such is the language of adultism when mounted on academic stilts.

A NEW VIEW OF JULIUS CAESAR.¹

WE took up this book with a vague feeling that it would be an imitation of Gibbon, which was caused by its title; but we soon found our mistake, and before we had read many pages we were absorbed by its enthralling interest. We use these words with intention; they are not exaggerated. Whatever may finally be decided as to its authority, there can be no doubt as to its remarkable hold upon the attention. It is impossible to put it down; our sympathies are deeply engaged for the actors, who walk before us as real living men, whether the men whose names they bear we do not yet say. In fact, the picture they represent is in so many respects different from tradition that it would be rash to pronounce finally on that matter before we have had a long time to ruminate upon the new picture. Besides the lifelike picture, the author has the merit of an admirable and pointed style, and he has been fortunate in his translator. Another point of importance are the frequent allusions to modern conditions, in which care is taken to explain the presence or absence of conditions that affect the

¹ "The Greatness and Decline of Rome." I. The Empire Builders; II. Julius Caesar. By Guglielmo Ferrero. Translated by Alfred Zimmern. vi+323, vi+390 pp. (Heinemann. 17s. net.)

problems under examination. Politicians ought to find here valuable lessons in caution, which may even lead them to wisdom, if they are capable of being taught anything.

It is impossible to discuss all the persons of the drama; Gracchus, for example, or Catiline, Lucullus, Crassus, the adroit Curio, and Clodius; Sulla and one or two others appear much as usual. But the attention is fixed chiefly on the great riddles of the last days of the republic—Brutus, and Pompey, and Caesar himself. In Brutus the real key to the puzzle, in our author's opinion, is vanity with underlying feebleness. "He loved to pose as a hero of iron will and unshrinking resolution, a model of those difficult virtues which can only be exercised by dint of painful self-mastery." He was thus an easy victim to the wiles of Cassius, a clever and subtle man, who was the real source of the conspiracy against Caesar. Pompey is the typical aristocrat; a great man with genuine ability, but no originality, who all his life had been the spoilt child of fortune. His greatest apparent feat, the subjugation of the pirates, was a sham: in a very short time after, they are found as active as ever. On the other hand, Caesar all his life was crushed under a mass of difficulties, which to overcome he had recourse to a succession of desperate expedients that brought him again and again to the verge of ruin; and when at last he found himself in a position to work out his far-reaching ideas, he was killed. M. Ferrero allows him almost every claim to greatness, but will not allow him to be a great statesman; to him Caesar appears as a great opportunist, and he depicts Caesar a prey to doubt and hesitation and uncertainty, but recognises that when Caesar made up his mind to a course he acted with lightning swiftness and the most ruthless energy. But all these, Pompey, Caesar, and the rest, were blindly working out the secret irresistible tendency of the time, the change of a self-centred agricultural community to an industrial State; and he sees in the same tendency the cause of the new imperialism, begun by Lucullus, its most successful leader, and carried on by others for various reasons, personal or political.

This is certainly a new view of Caesar, and in a less degree of many of the other actors in the tragedy; and we must leave it to readers of the book to examine the grounds on which M. Ferrero bases his view. To our mind, even if his view be not fully accepted by scholars, he has done a great service in reducing the chaos of those times to some kind of order. We have felt admiration for the lucid way in which he handles the complicated and confused materials of the tale, and we are glad to see that the Cambridge Modern History has not said the last word on historical style.

The Prologue to Piers Plowman. Edited by C. T. Onions. 24 pp. (Marshall.) 3d.—A very useful addition to "The Carmelite Classics." It has notes on grammar and metre, a glossary, and a set of questions.

BRITAIN BEYOND THE SEAS.¹

THIS, the first of two volumes promised by the author of "Where Three Empires Meet," is most valuable for teachers of the history and geography of the British Empire. It deals with the "Nearer Empire," i.e., the Mediterranean, African, and American possessions of the United Kingdom. A short account of Egypt is included on account of the importance of British interests and influence along the Nile and the Suez Canal. The second volume will deal with Asia and Oceania. Interesting, and therefore thoroughly readable, this first book fulfils the promise of the opening words of the preface—"in a work of moderate compass to give a comprehensive account of the British possessions beyond the seas—to explain what the British Empire is; how it came to be; the history of its growth; the physical, political, and commercial geography of its various parts."

The scheme throughout is methodical; a historical section introduces each colony to the reader, and then in their order come notes on the population and area, physical geography, products and industries, towns and communications. It is well up to date; the new constitutions of the Transvaal and of the Orange River Colony are introduced; the railways of Rhodesia are brought up to "rail-head," and the ultimate connection of the great trunk line with Lobito Bay foreshadowed; the Kingston earthquake is alluded to.

Statistics present the usual difficulty, and the author notes it with a word of warning in his preface. They are always changing, and never more so than in the case of young and lucky colonial olive branches. We do not think Mr. Knight has met the difficulty as well as he might. His statistics range over three years, 1904–6. It would have been better, certainly more useful, to have confined them to one year, and to have reduced them as far as possible to percentages.

The maps are good. They are nine in number, all coloured, and of a fair size. Three of them are world-maps of temperature, rainfall, and vegetation, and their insertion is most commendable, though we can find little reference to them in the text; the rest are political maps of large areas. Naturally, therefore, they do not indicate the details of the various colonial subdivisions, and the need of small black-and-white sketch maps is most marked. To follow the author in his excellent remarks on the various islands of the West Indies, or the railway projects of the Grand Trunk and Northern Railways of Canada, or the isotherm for the warmest month in Canada, on the maps provided, is impossible. We have noticed, too, that his letterpress here and there differs slightly from his maps both in substance and in spelling. We suggest revision and addition here in the future edition, or editions, which the book well deserves.

A few other points will also bear alteration or modification: the capital of North Rhodesia is

¹ "Over-sea Britain." By E. F. Knight. 324 pp.; maps. (Murray, 1907.) 6s. net.

Livingstone and not Kalomo; Ungava is now annexed to Quebec and no longer one of the "N.W. Territories"; "Gondoroko" may be a printer's error for Gondokoro, but the author alone is responsible for using the same spelling, "cocoa," whether he means *cacao* or *coco-nut*; it is inaccurate to say that the bite of the tsetse fly is fatal; the French dispute is not the only "Fisheries question" in Newfoundland; the nickel mines of New Caledonia, though they compare favourably in quality of ore produced with those of Sudbury, are far behind in quantity; Alberta is certainly both a cattle-ranching and wheat-growing province, but the cattle are being driven further and further north, as the rich lands of the south are coming under the plough.

But these are small holes to pick in what is really a most satisfactory piece of work, and one—to change the metaphor—most diplomatically engineered. There are many controversial points which must arise in an account of the growth of our Colonial Empire. Mr. Knight preserves a balance on the expression of his own convictions. If he grieves over what England lost (?) in the "Partition of Africa," or eulogises Lord Milner, or approves of the maxim that "Trade follows the Flag," he is at the same time careful to note that the Empire, notwithstanding its great men, mostly "grewed," like Topsy, that, after all, our much belauded Colonial policy was largely a policy of drift, and that the employment of Chinese indentured labour in the Transvaal was an experiment even from the first. Teachers and higher students should get this book, though we could wish that the publishers had seen their way to issue it at a slightly lower price.

TWO STUDIES IN ENGLISH LITERATURE.¹

If the promised American series of "Types of English Literature" is going to be, all of it, as good as its first volume, Prof. Francis Gummere's account of "The Popular Ballad" (1), we may look for a very notable addition to English literary criticism. It would be impossible to praise too highly either the matter or the manner of Prof. Gummere's book. He has the advantage of a thesis to maintain—the thesis of the popular origin of the ballad, disputed by so high an authority on the history of English poetry as Prof. Courthope—and he maintains it with skill, humour, and eloquence. His point of view can be shown most clearly by quoting his definition of the popular ballad—"a poem meant for singing, quite impersonal in manner, narrative in material, probably connected in its origins with the communal dance, but submitted to a process of oral tradition among people who are free from literary influences and fairly homogeneous in character."

The study is divided into four chapters. The

first discusses the specific marks of the ballad, its structure, the choral and epic elements in it, and so forth. The second classifies the ballads—the oldest groups (riddle ballad, stolen brides, domestic complications, ballads of the dance, &c.), ballads of kinship, the coronach and ballads of the supernatural, legendary ballads, border ballads, greenwood ballads. In the third chapter the sources are handled, and in the fourth the value of the ballads—"a murmur of voices in concert, borne over great stretches of space and through many changes of time"—is ably championed. The final passage, it is hardly too much to say, has something of the nobility and earnestness and musical quality that are so profoundly moving in Sir Philip Sidney's "Apology for Poetry."

Though Mr. Maynadier's Arthurian study (2), which also comes to us from America, can hardly take rank as a contribution to literary criticism with the remarkable book we have just noticed, it is still very good of its kind. What that kind is may perhaps be indicated most clearly to the English reader if we describe it as a series of University Extension lectures of the best type. Yet such a description would do a little less than justice to the amount of research which has gone to the making of it.

Many books have been written on the Arthurian legends, but there is none, so far as we know, that precisely covers the ground traversed by these lectures. They treat the early origins and growth of the legends with a good deal of fulness, so that Malory is not reached till the thirteenth chapter out of twenty-two; and their later history is followed carefully through the English poets from Spenser to the present time. The treatment of Tennyson's "Idylls," though appreciative, is very slight; but this is in one way an advantage, as more room is left for poems that are less familiar to most readers.

One of Mr. Maynadier's stories is too good to be omitted, even from a short notice. Giraldus Cambrensis, wishing to intimate that he has no high opinion of the veracity of Geoffrey of Monmouth, tells a story of a Welshman, Meilyr, who had the power of detecting a lie, because he always saw a little devil exulting on the liar's tongue. If Meilyr was in the presence of a book containing falsehoods, evil spirits would swarm on his person; but if the Gospel of St. John was placed on his bosom, the devils immediately vanished. Once the history of Geoffrey was substituted for the Gospel, with the result that the devils reappeared in greater numbers, and remained a longer time than ever before. Such were the amenities of mediæval reviewing. Happily, on this occasion at least, a modern reviewer need feel no desire to emulate them.

¹ (1) "The Popular Ballad." By Francis B. Gummere. ("Types of English Literature," edited by Prof. W. A. Neilson, of Harvard University.) xv+360 pp. (Constable.) 6s. net.

(2) "The Arthur of the English Poets." By Howard Maynadier. ix+454 pp. (Constable.) 6s. net.

La Chanson de Roland. Adapted by H. Rieu. 96 pp. (Methuen.) 1s.—This is another volume of "Methuen's Simplified Texts," several of which we have reviewed. Mr. Rieu has retold the famous story well. The vocabulary seems to be complete.

BOOKS OF TRAVEL AS AN AID TO THE TEACHING OF GEOGRAPHY.

By F. D. HERBERTSON, B.A. (Lond.).

NOTHING is more difficult than to suggest a selection of books of travel as supplementary to the ordinary text-book. The writer is, indeed, very doubtful if much is gained by using them in this way. From a geographical point of view few books of travel are very satisfactory, for, as Dr. H. R. Mill long ago pointed out, few travellers have been geographers. Ball, Bates, Belt, Darwin, Hooker, Humboldt, Livingstone, and Wallace are among the illustrious exceptions to this rule. The ordinary traveller, unfortunately, sees but little, and that little unessential. Moreover, books of travel are hardly published before they are out of date, so far as economic conditions are concerned, more especially those dealing with the new lands of the world.

The list below attempts to suggest a few of the more useful books for each continent. It is needless to say that it might be almost indefinitely extended, and that many excellent books are omitted. Several of the older travellers are included for their excellent descriptions of the permanent geographical conditions. These are denoted by the sign †. The later books are frequently valuable for their illustrations.

Far more useful, generally speaking, than books of travel are the articles published in the various geographical journals. A list of the most important of these and of the best books of travel, with critical notes, forms one of the chapters of the indispensable "Hints to Teachers on the Choice of Books," to be published almost immediately for the Geographical Association. For fuller information teachers are referred to these sources.

EUROPE.

Austria-Hungary.

- Ansted, Prof. D. J. "A Short Trip in Hungary and Transylvania." (W. H. Allen.)
 Asboth, J. de. "Official Tour through Bosnia." (Sonnen-schein.)
 Kohl, J. G. "Austria." (Chapman and Hall.)
 Grohmann, W. A. "The Land in the Mountains." (Simpkin, 1907.) 12s. 6d. net.
 Munro, R. "Rambles and Studies in Bosnia, Herze-govina, and Dalmatia." (Blackwood.)
 Palmer, F. H. E. "Austrian Life in Town and Country." (Newnes.) 3s. 6d.

Balkan States, Turkey, and Greece.

- "Bulgaria of To-day." Official Publication of the Bulgarian Ministry of Commerce and Agriculture, 1907. Free.
 Durham, M. E. "Through the Lands of the Serb." (Arnold, 1904.) 14s. net.
 Fraser, J. F. "Pictures from the Balkans." (Cassell, 1906.) 6s.
 Garnett, L. "Turkish Life in Town and Country." (Newnes.) 3s. 6d.
 Lavaleye, E. de. "The Balkan Peninsula." English translation. (Fisher Unwin, 1887.) 16s.

- Lear, E. "Journals of a Landscape Painter in Albania." (Bentley.)
 Menzies, S. "Turkey Old and New." (W. H. Allen.)
 Mahaffy, J. P. "Rambles and Studies in Greece." (Mac-millan.) 5s. net.
 Miller, W. "Greek Life in Town and Country." (Newnes.) 3s. 6d.
 Odysseus (Sir C. Eliot). "Turkey in Europe." (Arnold, 1900.)
 Samuelson, J. "Rumania." (Kegan Paul, 1888.) 10s. 6d.
 Vivian, H. "Servia." (Longmans.)

Denmark, Sweden, Norway, Iceland.

- Bisiker, W. "Across Iceland." (Arnold, 1902.)
 Bröchner, J. "Danish Life in Town and Country." (Newnes.) 3s. 6d.
 Du Chaillu, P. "Land of the Midnight Sun." 2 vols. (Murray, 1881.)
 Dufferin, Lord. "Letters from High Latitudes." (Murray.) 7s. 6d.
 Forrester, G. "Rambles in Norway." (Longmans, 1855.)
 Hansen, Prof. "Norway." Official Publication for the Paris Exhibition.
 Heidenstam, O. G. "Swedish Life in Town and Coun-try." (Newnes.) 3s. 6d.
 "Sweden." Official Handbook published for the Paris Exhibition.

France.

- Baring-Gould, S. "Deserts of Southern France." (Methuen, 1894.) 32s.
 "Book of the Cevennes." (Long, 1907.) 6s.
 Betham-Edwards, M. E. "A Year in Western France." (Longmans.)
 "France of To-day." (Percival.)
 "Holidays in Eastern France." (Hurst and Blackett.)
 Hugo, V. "Alpes et Pyrénées." English translation. (Sands.)
 Lynch. "French Life in Town and Country." (Newnes.) 3s. 6d.
 Marcel, E. A. "Les Cevennes et la Région des Causses." (Paris: Delegrave.)
 Reclus, O. "La France et ses Colonies." (Hachette.)
 Taine, H. "Garnets de Voyage." (Paris.)

Germany, Holland, and Belgium.

- Baring-Gould, S. "Germany." (Sampson Low.) 3s. 6d.
 Blackburn, H. "The Harz Mountains." (Sampson Low.)
 Boulger, D. "Belgian Life in Town and Country." (Newnes.) 3s. 6d.
 Dawson, W. H. "German Life in Town and Country." (Newnes.) 3s. 6d.
 Hough, P. M. "Dutch Life in Town and Country." (Newnes.) 3s. 6d.
 Macdonnell, A. A. "Camping Voyages in German Waters." (Stanford, 1889.) 10s. 6d.
 Mahaffy, J. F., and Rogers, J. E. "Sketches from a Tour through Holland and Germany." (Macmillan, 1889.) 10s. 6d.

Italy.

- Deecke, Prof. W. "Italy." (Sonnen-schein, 1904.) 15s.
 Gauthier, Théophile. "Voyage en Italie."
 Hare, A. J. C. "Venice." (Allen.)
 "Walks in Rome." (Allen, 1892.)
 Howells, W. D. "Tuscan Cities." (Edinburgh: Douglas.)
 Villari, L. "Italian Life in Town and Country." (Newnes, 1902.) 3s. 6d.

Portugal.

Crawford, O. "Round the Calendar in Portugal." (1890.) 21s.

Hume, Martin. "Through Portugal." (Grant Richards, 1907.) 5s. net.

Russia.

Palmer, F. H. E. "Russian Life in Town and Country." (Newnes, 1906.) 3s. 6d.

Trevor-Battye, A. A. "Northern Highway of the Tsar." (Constable, 1898.) 6s.

Wallace, Sir D. "Russia." 2 vols. (Cassell, 1905.) 24s. Windt, H. de. "Finland as it is." (Murray, 1901.) 9s. net.

Spain.

Ford, R. "Handbook for Travellers in Spain." First edition. (Murray, 1845.)

Gadow, H. "In Northern Spain." (Black, 1897.)

Gauthier, Théophile. "Voyage en Espagne." (Paris: Charpentier.)

Hare, A. J. C. "Wanderings in Spain." (Allen.)

Higgens, L. "Spanish Life in Town and Country." (Newnes, 1902.) 3s. 6d.

Switzerland.

Story, A. T. "Swiss Life in Town and Country." (Newnes, 1902.) 3s. 6d.

Tschudi, F. von. "Sketches of Nature in the Alps." (Out of print.)

Innumerable mountaineering books.

*AFRICA.**Egypt, the Nile, and Abyssinia.*

Baker, Sir S. "Nile Tributaries of Abyssinia." (Macmillan, 1862.) 6s.

"The Albert Nyanza." (Macmillan, 1865.) 6s.

†Bruce, J. "Travels through Part of Africa into Abyssinia to discover the Source of the Nile (1768-1773)." (Chambers.) 2s.

Milner, Lord. "England in Egypt." Seventh edition. (Arnold, 1899.)

Schweinfurth, Dr. G. "Heart of Africa." 2 vols. (Sampson Low.) 7s.

White, A. S. "Expansion of Egypt." (Methuen.)

"From Sphinx to Oracle." (Hurst and Blackett.)

Wyld, A. B. "Modern Abyssinia." (Methuen, 1901.) 15s.

The Barbary States.

†Barth, H. "Travels in Africa." 2 vols. (Ward and Lock, Minerva Library.)

Harris, W. B. "Taflet." (Blackwood, 1895.) 12s.

Hooker, Sir J. D., and Ball, J. "Tour in Morocco and the Great Atlas." (Macmillan, 1878.) 21s.

Meakin, B. "The Land of the Moors." (Sonnenschein, 1901.) 15s.

"Life in Morocco." (Chatto and Windus, 1905.) 12s. 6d.

Thomson, J. "Travels in the Atlas and Southern Morocco." (Philip, 1889.) 9s.

West Africa, the Niger, and Central Sudan.

Alldridge, T. J. "The Sherbro and its Hinterland." (Macmillan, 1901.) 15s.

Barth, H. See above.

Bindloss, H. "In the Niger Country." (Blackwood, 1898.) 12s. 6d.

Johnston, Sir H. H. "Liberia." 2 vols. (Hutchinson, 1906.) £2 2s.

Kingsley, Mary. "Travels in West Africa." (Macmillan.) 7s. 6d.

Lugard, Lady. "A Tropical Dependency." (Nisbet, 1905.) 18s.

†Park, Mungo. "Travels in the Interior of Africa." (Black.) 3s. 6d.

Partridge, C. "Cross River Natives." (Hutchinson, 1905.) 12s. 6d. net.

Schweinfurth, G. See above.

The Congo Basin and Equatorial Africa.

Johnston, Sir H. H. "The Congo." (Sampson Low.) 2s. 6d.

Stanley, Sir H. M. "In Darkest Africa." (Sampson Low.) 15s. 6d. and 5s. 6d.

Central and East Africa.

Gregory, J. W. "The Great Rift Valley." (Murray, 1896.) 21s.

Johnston, Sir H. H. "British Central Africa." (Methuen, 1898.) 12s.

"The Uganda Protectorate." Second edition. 2 vols. (Hutchinson, 1905.) 24s.

†Livingstone, D. "First Expedition to Africa, 1840-56." (Murray.) 7s. 6d.

"Second Expedition to Africa, 1858-64." (Murray.) 7s. 6d.

"Last Journals in Central Africa." 2 vols. (Murray, 1874.) 28s.

Moore, J. E. S. "To the Mountains of the Moon." (Hurst and Blackett, 1901.)

Thomson, J. "Through Masai Land." (Sampson Low.) 2s. 6d.

South Africa.

Bryce, J. "Impressions of South Africa." (Macmillan, 1899.) 6s.

Ferguson, F. W. "Southern Rhodesia." (Collingridge, 1907.)

Galton, F. "Travels in South Africa." (Ward and Lock.) 2s.

African Islands.

Ellis, Col. A. B. "West African Islands." (Chapman and Hall.)

Keller, Dr. C. "Madagascar, Mauritius, and the other East African Islands." (Sonnenschein, 1901.) 7s. 6d.

Sibree, Rev. J. "The Great African Island." (Kegan Paul, 1880.) 12s. 6d.

*ASIA.**Siberia.*

Bookwalter, J. W. "Siberia and Central Asia." (Pearson, 1900.)

Brehm, A. E. "From North Pole to Equator." (Blackie, 1896.) 15s.

Fraser, J. F. "The Real Siberia." (Cassell, 1902.) 3s. 6d.

Stadling, J. "Through Siberia." (Constable, 1901.)

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Bryce, J. "Transcaucasia and Ararat." (Macmillan, 1877.)

Burton, Sir R. "Personal Narrative of a Pilgrimage to El Medina and Mecca."

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Smith, G. A. "Historical Geography of the Holy Land." (Hodder and Stoughton, 1897.)

Palgrave, W. G. "Year's Journey through Central and Eastern Arabia." 2 vols. (Murray, 1865.)
 Percy, Lord. "Notes from a Diary in Asiatic Turkey." (Arnold, 1901.) 14s.
 "Highlands of Asiatic Turkey." (Arnold, 1901.) 14s.
 Tozer, H. F. "Turkish Armenia and Eastern Asia Minor." (Longmans, 1881.)

Persia.

Bishop, Mrs. "Journeys in Persia and Kurdistan." (Murray.) 24s.
 Curzon, Lord. "Persia and the Persian Question." 2 vols. (Longmans, 1892.) 42s.
 Sykes, Major P. M. "Ten Thousand Miles in Persia." (Murray, 1902.) 25s.

Central Asia, the Himalayas, and Tibet.

Curzon, Lord. "The Pamirs and the Source of the Oxus." (Murray.) 6s. (Out of print.)
 Hedin, Sven. "Through Asia." (Murray.) 20s.
 "Adventures in Tibet." (Hurst and Blackett, 1904.) 10s. 6d.
 Holdich, Sir T. "The Indian Borderland." (Methuen.) 10s. 6d. net.
 Hooker, Sir J. "Himalayan Journals." (Ward and Lock.) 2s.
 Knight, E. F. "Where Three Empires Meet." (Longmans.) 3s. 6d.
 Landon, P. "Lhasa." 2 vols. (Hurst and Blackett, 1905.) 42s.
 Rawling, Capt. C. G. "The Great Plateau." (Arnold, 1905.) 18s. net.

Ronaldshay, Earl of. "On the Outskirts of Empire in Asia." (Blackwood, 1904.) 21s.
 Robertson, Sir G. S. "The Kafirs of the Hindu Kush." (Lawrence and Bullen, 1896.) 31s. 6d.
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 Wood, Lieut. J. "Journey to the Source of the Oxus." (Murray, 1841.)

Younghusband, Sir F. "The Heart of a Continent." (Murray, 1896.) 21s.

India.

Caine, W. S. "Picturesque India." (Routledge.)
 Cave, H. W. "Picturesque Ceylon." 3 vols. (Sampson Low.) 77s.
 Compton, H. "Indian Life in Town and Country." (Newnes, 1905.) 3s. 6d.
 Forsyth, Captain J. "Highlands of Central India." (Chapman and Hall, 1872.)
 Laurence, W. R. "Kashmir." (Froude, 1895.) 12s. net.
 Landon, P. "Under the Sun." (Hurst and Blackett, 1906.) 12s. 6d.
 Low, Sidney. "A Vision of India." (Smith, Elder, 1906.) 10s. 6d.
 Workman, W. H. and F. B. "Through Jungle and Town." (Fisher Unwin, 1904.) 16s.

China and Japan.

Bishop, Mrs. "Yangtse Valley and Beyond." (Murray, 1899.) 21s.
 "Unbeaten Tracks in Japan." (Murray.) 7s. 6d.
 "Korea and Her Neighbours." (Murray, 1898.) 24s.
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 "Three Years in Western China." (Philip.) 6s.
 Hamilton, A. "Korea." (Heinemann, 1904.) 15s. net.
 Huc, Abbé. "Travels in Tartary, China, and Tibet in the Years 1844, '45, '46."

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 Rein, Prof. J. J. "Japan." (Hodder and Stoughton, 1880.)
 Weston, Rev. W. "The Japanese Alps." (Murray.) 21s.
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 There are innumerable books on Japan, but few can be recommended for the teacher's purpose.
 Further India, Indo-China, Malayia, &c.
 Bishop, Mrs. "The Golden Chersonese." (Murray, 1883.)
 Forbes, H. O. "A Naturalist's Wanderings in the Eastern Archipelago." (Samson Low, 1885.) 21s.
 Guilleard, F. H. H. "Cruise of the *Marchesa*." (Murray, 1886.) 21s.
 Orléans, Prince Henri of. "Around Tongking and Siam." (Chapman and Hall, 1894.)
 Vincent, F. "Land of the White Elephant." (Sampson Low, 1873.)
 Wallace, A. R. "The Malay Archipelago." (Macmillan, 1890.) 7s. 6d.
 Worcester, D. C. "The Philippine Islands." (Macmillan, 1898.)
 Young, E. "Kingdom of the Yellow Robe." (Constable, 1898.)
 Younghusband, Capt. G. J. "Eighteen Hundred Miles through Burma, Siam, and through the Eastern Shan States." (W. H. Allen, 1888.)

AUSTRALASIA.

Australia.

Carnegie, Hon. D. "Spinefox and Sand." (Pearson.)
 Giles, E. "Australia Twice Traversed." (Sampson Low, 1890.)
 Gregory, J. W. "The Dead Heart of Australia." (Murray, 1906.) 16s. net.
 Saville-Kent, W. "The Great Barrier Reef of Australia." (Allen, 1893.) £4.
 Mitchell, Sir T. L. "Journal of an Expedition into the Interior of Tropical Australia." (Longmans, 1848.)
 Sturt, Capt. C. "Narrative of an Expedition into Central Australia." (Boone, 1839.)
 "Two Expeditions into the Interior of Southern Queensland during the Years 1829, 1830, 1831." (Smith, Elder, 1833.)
 Vivienne, M. "Travels in W. Australia." (Heinemann, 1901.)
 New Zealand.

Fitzgerald, E. A. "Climbs in the New Zealand Alps." (Unwin, 1896.) 31s. 6d.
 Reeves, W. P. "The Long White Cloud." (Horace Marshall.)
 New Guinea.

Romilly, H. H. "Western Pacific and New Guinea." (Murray, 1886.) 7s. 6d.
 Thomson, J. P. "British New Guinea." (Philip, 1892.) 21s.
 Pacific Islands.

Brassey, Lady. "Voyage in the *Sunbeam*." (Longmans.) 6d.
 Buley, E. C. "Australian Life in Town and Country." (Newnes, 1905.)
 Cook, Captain. "Three Voyages Round the World." (Routledge, 1897.) 21s.

- Darwin, C. "Voyage of the *Beagle*." (Ward and Lock.) 2s.
 Grimshaw, B. "From Fiji to the Cannibal Islands." (Nash, 1907.)
 Guppy, H. B. "The Solomon Islands." 2 vols. (Sonnenschein, 1887.) 35s. 6d.
 Horne, J. "A Year in Fiji." (Stanford, 1881.)

NORTH AMERICA.

- Bryant, W. C. "Picturesque America." 4 vols. (Cassell.) £8 8s.

British North America.

- Butler, Sir W. F. "The Great Lone Land." (Sampson Low, 1872.) 2s. 6d.
 "The Wild North Land." (Sampson Low, 1874.) 2s. 6d.
 Bradley, A. G. "Canada in the Twentieth Century." (Constable, 1905.) 16s.
 Fraser, J. F. "Canada as it is." (Cassell, 1905.) 6s.
 Hardy, Capt. Campbell. "Forest Life in Acadia." (Chapman and Hall, 1869.)
 Lees, J. A., and Clutterbuck, W. J. "B.C. 1897." (Longmans, 1897.) 3s. 6d.
 Morgan, H. T. "Canadian Life in Town and Country." (Newnes, 1905.) 3s. 6d.
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THE HEALTH OF SECONDARY-SCHOOL PUPILS IN LONDON.¹

SCHOOL hygiene is being more and more recognised as a highly specialised branch of public health, which, in order that justice may be done to the children and to public interests, requires for its administration experienced and specially trained medical officers. In London great progress has been made already in the direction of securing healthy conditions in the schools, and a well-qualified corps of doctors under the leadership of Dr. James Kerr is actively engaged in further investigating the circumstances which in the schools must determine the satisfactory physical well-being of the scholars.

The recently published report teems with interesting data, and should afford comfort to those educational pessimists who allege that the energy of the officials who administer education in London is almost wholly dissipated in the compilation of useless statistics and in securing a mechanical adherence on the part of the teachers to a rigid system enforced from headquarters. The report provides overwhelming evidence that a scientifically planned survey of the physical condition of the present pupils is being carried out, and that carefully organised experiments are in progress designed to determine the best means of securing satisfactory ventilation and lighting of class-rooms, of avoiding unnecessary mental fatigue, and of adapting school curricula to special needs. The report may, in fact, be commended heartily to the attention of educational administrators and schoolmasters for the professional assistance it renders, and to the social reformer and householder as providing a valuable indication of some of the good accomplished by education rates.

So numerous are the subjects of interest dealt with by Dr. Kerr, that it is possible here to refer only to a few typical inquiries which are being instituted.

MEDICAL INSPECTION OF SECONDARY SCHOOLS.

In April, 1906, it was decided that arrangements should be made for periodical medical examination of pupils in the Council's secondary schools. The medical superintendence of the schools, hygiene of buildings and general matters, is done by the permanent office staff. As the majority of the pupils are girls in their teens, the individual handling of these girls is done by medical women,

except in special cases where they desire further consultation. Each pupil is separately examined on entering the school, and a regular medical report form filled up. It adds considerably to the working capacity of the pupils, especially in the case of girls, and prevents illness, if they can have access to lay any matters which they desire before the medical officer. A regular consultation day is therefore arranged about once in six weeks, when any pupil may see the doctor in regard to any trouble affecting her work, such as headache, neuralgia, sore throat, sleeplessness, or over-fatigue, which would otherwise generally be allowed to run on unrelieved. The parents were present in many cases, and appreciated the doctor's examination of their children. Headmistresses are quite unanimous in regard to the fundamental importance of this work in these schools where the physical condition of the children is considerably below the type of high-school girl, to which most of them have been accustomed. They feel the great help of medical examinations. They have altered time-tables, arranged special classes, and made individual arrangements to suit particular pupils according to the doctor's advice.

Since September, 1906, Dr. Annie Gowdey and Miss Campbell have been engaged on the inspection of the girls in the secondary schools and training colleges, some 1,350 girls passing through their hands. In the secondary schools, about 15 per cent. were below the average nutrition and 24 per cent. anaemic. Headaches were complained of by 20·5 per cent., in many cases without obvious cause; but in others anaemia, defective vision, stomach troubles, and reading late at night were frequently noted. Exaggerated movements, corrugated foreheads, insomnia, and somnambulism were met with. Several cases of overstrain were specially reported. Similar conditions were found in the training colleges, but the standard of personal cleanliness, although not always quite satisfactory, was, of course, much higher, and the use of the toothbrush better understood. The most striking fact brought out by the medical inspection seems to be ignorance of the ordinary elementary rules of health. A course of hygiene should take a leading and prominent position in the school. The average standard of physique is low. The necessity for a frequent bath, that a daily wash should embrace more than the face and hands, and that the same undergarments should not be worn during the day and night, has had to be frequently insisted on.

DENTAL CONDITIONS.

The secondary schools and training colleges show dental conditions among their pupils which, considering their age and status, are no better than the conditions of neglect and offensiveness found in the elementary schools. Of 134 boys examined at Paddington Technical School and at Hackney Downs, 62 per cent. had two or more decaying teeth. In many cases there were spongy gums, and two had suppurating conditions. Among the men students at Offord Road neglect of the mouth was general, and several cases had suppurating conditions, the foulness in some being almost as offensive as *ozæna*. Among the girls of the secondary schools, for æsthetic reasons, the conditions are somewhat better, but one-third required improvement. Some never used a tooth-brush, some once a month, or once a week, and so on, and few appeared to realise the importance of the hygiene of the mouth. In the training colleges, although 43 per cent. are returned with dental defects, the use of the tooth-brush and attention to oral hygiene is much better, although there is yet great room for improvement. Hitherto the futility of mere examinations without treatment in dental cases has

¹ Report of the Education Committee of the London County Council submitting the Report of the Medical Officer (Education) for the Year ended March 31st, 1907. 60 pp. (King.) 1s.

made the employment of school dentists scarcely a matter of practical politics. The experience of the last three or four years in Germany has, however, altered this. Prof. Jessen, of Strassburg, from his dental work in connection with the army, was led to turn his attention to preventative measures among the school children. He has worked out a scheme for school dental care which was taken up by the municipality, and is now being adopted as the pattern throughout central Europe. During a recent visit to Strassburg this work was shown and demonstrated, and the work conducted on somewhat similar lines in other towns was also seen and inquired into.

FATIGUE.

Fatigue is nature's danger signal to prevent excessive wear and tear. It is almost certainly due to toxic action, to definite chemical products, accumulating locally and later becoming generalised in the blood. Recent experimenters have asserted what Erlich's theories would suggest, namely, the power of preparing antitoxin which prevents fatigue. The normal course of work indicates that some such changes happen. There is a consciousness of working more effectively, so far as mental work is concerned, in the second or third hour of work than in the first. Partly for this reason and partly because it is the natural way of development noticed in young animals, we have always maintained that the most educational form of any exercise for growing structures is in short, sharp, violent bursts, with relapses to comparative quiet. The physical exercise of infants during evolution of their motor acquirements should tend to forms explosive in violence and duration. A healthy organism will not suffer from such exercise. Running, jumping, and simple, short and large movements are not only judicious in the infant department, but it is an educational crime to withhold them. Play can become a labour, and organised games tedious weariness, just as drills or exercises may be done so slowly or carefully that they are a source of serious exhaustion and fatigue. It is therefore wrong not to have physical exercises of a simple nature and plenty of them in the infants' schools, but the teachers must learn to know almost instinctively what to avoid and what is useful.

Early fatigue symptoms, quickened heart action and respiration, with flushed face and sharpened mental activity, are the very results wanted by our scheme of exercises. But many out-of-school exercises, especially swimming lessons and contests, are more exacting, because respiration is impeded, and these sometimes become most exhausting exercises, breathlessness being especially noticeable among the young girls. In contests between older boys, particularly if of different racial stocks, there may be difficulties if they are matched age for age. The tendencies of development at each age must be respected. If at the proper time the particular educational tendency is neglected, then the education is incomplete and defective in some respects. The tendency of the girls to nurse dolls or of the boys to play soldiers is absolutely natural. The failure to exhibit these normal tastes may be held to indicate mental defect, and often that defect is elusive in being shown only by perverted moral traits.

EFFECT OF VENTILATION ON SCHOOL FATIGUE.

Since reporting in 1904 on experiments on the need for ventilation of certain class-rooms, chiefly shown by determinations of the deterioration of air by the carbonic acid gas present, attention has been directed to the almost inexplicable subjective feelings of languor and fatigue

noticed in many mechanically as well as naturally ventilated schools. Some mechanically ventilated schools are almost museums of mistakes; most in London are failures from want of appreciation of the problems to be treated, but the failures are purely in matters of engineering. It only seems to be in schools with warmed air, where the air supply runs up to about 2,000 cubic feet per head per hour, that freedom from the easily induced exhaustion is found. Although every schoolroom should be mechanically ventilated, yet the necessary arrangements with low-pressure fans, otherwise desirable for school purposes, seem in London to be almost out of the question owing to cost in space and material.

From Dr. Haldane's observations, the actual amount of respiratory carbon dioxide appears to have little to do with the production of unpleasant symptoms, and no evidence can be obtained of the existence of the *anthropotoxin* previously generally supposed to exist. He favours the idea that temperature and humidity, by interfering with the loss of heat from the body surface, disturb metabolism and induce unpleasant or even dangerous symptoms. These observations have been independently confirmed by various workers in the laboratories of Prof. Flügge at Breslau.

It has therefore been attempted to supplement the previous observations on school air in London by observations on fatigue, and also on the relation of the atmosphere to the working capacity of the children.

Although many gaps remain to be filled ere these observations constitute a complete series, the following conclusions seem indicated:

(i) Mental alertness and accuracy are improved by two or three hours of school work, provided that the atmosphere is satisfactory.

(ii) Temperatures above 65° F. give rise to definite subjective symptoms—slackness and inattention in some, headaches in others—although it is not easy to assert definite mental alteration until about 70° F.

(iii) Symptoms do not appear at 65° if the air is kept in gentle movement by a fan in the room. At higher temperatures the symptoms and mental conditions are ameliorated by such movement of the air.

(iv) With temperatures 70° F. and above, other factors being normal, there are marked symptoms and very evident deterioration in mental alertness and accuracy.

(v) Relative humidity does not affect the mental capacity of children at low temperatures. Increase of humidity appears to increase the effects of high temperature.

(vi) Carbonic acid gas in considerable excess, although not producing the symptoms found in a hot and close atmosphere, seems to produce, after a time, considerable fatigue in the performance of mental functions by the children.

A First Year's Course in Geometry and Physics. Parts i.-iii. By Ernest Young. 169 pp. (Bell.) 2s. 6d. Parts i.-ii., separately, 1s. 6d.; part iii. only, 1s.—This work is intended for use in secondary schools working under the Board of Education regulations. Part i. furnishes a combined course in geometry and physics; part ii. contains the second and third terms' work in geometry; and part iii. contains the work in physics for the same terms. It is assumed that, in each week, $\frac{1}{2}$ hours shall be devoted to geometry and $2\frac{1}{2}$ hours to physics, $\frac{1}{2}$ hours of the latter period being spent in the laboratory. This volume will prove of much service in any secondary school, and it has evidently been prepared by an experienced teacher.

NATURE-STUDY IN SECONDARY SCHOOLS.¹

By J. S. DAVIS, M.A.
Vice-Principal of Culham College.

NATURE-STUDY is, unfortunately, regarded by some as a new subject—something additional introduced into an already crowded curriculum. It is by no means new—Bacon wrote of it, and it received the approval of Milton. It has no end—it knows no boundaries—it is merely a more efficient means of imparting general knowledge.

Almost any text-book will show that we begin to teach science at the wrong end. Consider how the student is taught the properties of light—how by experiment with the electric spark he is shown that the violet rays are the most refrangible and the red rays the least. It may be years afterwards that he sees some experiment which gives, for the first time, a real meaning to these words. Now read Edgeworth's "Practical Education." A boy of nine finds a kind of rainbow on the floor. He calls his sister to see, and wonders how it came there. The sun shines brightly through the window. The boy moves several things in the room, but it makes no change. At last, when he moves a tumbler of water, the rainbow disappears. There are some violets in the tumbler, which he thinks may explain the colours on the floor. But when the violets are removed the colours remain. Then he thinks it may be the water. He empties the glass. The colours remain, but they are fainter. This leads him to suppose that the water and the glass together make the rainbow. "But," says he, "there is no glass in the sky, yet there is a rainbow, so that I think the water alone would do if we could but hold it together without the glass." He then pours the water slowly out of the glass into a basin, which he places in the sunlight, and sees the colours on the floor twinkling behind the water as it falls.

I have introduced this story to illustrate the way in which one should proceed in nature-study. In this case we see that the boy had been trained to observe and to think and to inquire; and nature-study is a training in observation, in thinking, and in inquiry. The most serious fault of the teacher of to-day is that he is an extinguisher of curiosity. We all deaden our pupils' curiosity—we tell them too much—we do too much for them. Under the lists of bays and capes, of kings and queens, of chemical compounds, &c., we stifle curiosity. We tell our pupils such a lot, hoping that some small percentage may stick in their memory. What we do not foster is the thirst for knowledge—the habit of inquiry. As with Thomas Arnold, so it should be with us—it should be our chief business not so much to impart knowledge as to give our pupils an appetite for knowledge. By the introduction of nature-study the area of instruction is not necessarily extended, but it enables us more thoroughly to till the ground which is already in our possession, but not always effectively cultivated. We learn what we are at the time eager to know. We learn by doing, and get no result for which we have not worked.

What is nature-study? To define it would be harmful, for definition involves limitation, and to limit such a study would be to hinder its development. By attending to nature-study we do not despise the study of books, but rather the former is an introduction to the latter. The term nature-study has reference to the materials con-

sidered and to the methods adopted. It aptly expresses the spirit in which the work should be carried out. The materials are found in nature, and the methods are the methods of nature.

In the first place, nature-study is "nature"-study. It is the study of our surroundings. We hear a lot to-day of the all-importance of environment. If this be true, then we should make the best use of this factor. Nature-study is not merely listening to a teacher talking about nature, or listening to one who tells what he has read or seen, or studying books about nature; all these have their advantages—they all help us. But this is not nature-study. Essentially, Nature is out-of-doors, and to study her we must go out-of-doors into Nature's great laboratory.

Secondly, it is nature—"study." It is not talking or reading about nature, it is not glancing at the beauties of nature, but it is an organised study of nature by the teacher with the taught.

The advantages of nature-study are as numerous as they are great. There is scarcely a single subject of instruction into which nature-study does not enter: it can be correlated with so many subjects—with geography, modelling, woodwork, and drawing. Of course, this correlation must not be carried to excess, or we shall arrive at a state of affairs such as this: it was suggested that by such a correlation you would one day have a lesson on the bee, then you would sing about the bee, then recite about the bee, then read about the bee, then draw the bee, then paint the bee, and by the end of the week all would be sick of the bee. Do not do this, but so arrange matters that each subject in its turn is made the nucleus of many others which are grouped around it, and by this means the pupils learn to see the relation which exists between various natural objects.

But for a moment consider the relations of nature-study to art, to music, poetry, literature, philosophy—nay, even to theology; for who can study the growth even of the much despised wayside dandelion and not recognise and reverence there the workings of the Hand of God? As Tennyson has it:

"Flower in the crannied wall,
I pluck you out of the crannies,
I hold you here, root and all, in my hand,
Little flower—but if I could understand
What you are, root and all, and all in all,
I should know what God and man is."

Nature-study has a great power of interest—it leads us on through nature to nature's God.

Now I contend that nature-study should be the foundation subject of every school curriculum. In the first place, it is the subject most interesting to young people. They are, for the most part, naturally interested in animal and plant life. Do, then, let us follow their lead and give them the best conditions for nature-study.

Secondly, there is one Cause of everything, and nature is the work of His fingers. Thus, then, in all things there must be an underlying unity. Nature-study helps the pupil to adjust more clearly his relation to God, to mankind, and to Nature herself.

Thirdly, by means of nature-study the pupil learns that reverence for life which, alas! is often so sadly lacking in child nature. He learns sympathy for the lowliest forms of life—nature-study has such a refining influence. It widens and deepens the outlook of the student, and it makes that outlook brighter and fuller, for it enables him to see things in a true perspective—it gives him the sec-

¹ A paper read at a meeting of the Headmasters' Association, Division V. (Berks, Bucks, and Oxon).

ing eye, the hearing ear, and the understanding heart. The pupil is made to realise with Wordsworth that he is—

“well pleased to recognise
In Nature and the language of the sense
The anchor of my purer thoughts, the nurse,
The guide and guardian of my heart, and soul
Of all my moral being.”

There are many aims of nature-study, but perhaps the most important should be to awaken interest in one's surroundings, to cultivate the higher nature, æsthetical, ethical, and spiritual, and to develop the intellectual powers. Our aims in schools should be to promote individual work and the student's love for the subject. The student must be taught to work as an individual as well as a member of society. He must be trained in the habit of reverence and love for things of nature, for man, and for God. He must have the habit of exact observation, thought, and reflection.

So far I have tried to point out the advantages of an organised study of nature—advantages common to all—whether during school life or after school days are over. Now I come to the more practical part of my paper, viz., how in secondary schools a proper and useful study of nature may be organised.

In the first place, we must have a scheme. I think all will agree to that, although as to the rigidity and elasticity of that scheme people will differ. Now I have known in some schools schemes drawn up and rigidly adhered to, no matter what be the circumstances. The teacher had in his mind a set plan which he tenaciously held to, and would not be turned from it by wind or rain, snowstorm or sunshine. Do not do this—draw up a *general* season scheme; but woe be to that rash individual who dares to allot a date to nature's productions—disappointment only awaits him.

Then, again, some head-teachers draw up a scheme of nature-study for their teachers, who have to follow that scheme closely. This leaves no room for the individual teacher to use his own brains for his own class—it destroys individuality—it limits the study where no limitation should exist. This may be a good plan in the case of a young teacher who has had no experience; but even here I doubt the advisability of it; for I maintain that the best teacher of nature-study—the one who can best awaken enthusiasm in his class—is the teacher who learns nature-study with his class, who is, as it were, a discoverer on the same level as his pupils.

I think the best plan is to let each teacher have a suggestive scheme of work—a kind of general guide—but let him select and elaborate according to the needs of his class. If the class-teacher does this, he has a clear and definite idea of the subject in his mind and the way in which he intends to treat it, and the side-lights he intends to bring to bear upon it. Surely by this means the teacher gains more confidence, and the pupils reap a greater advantage.

Now, not only must we have a scheme, but it must be a good one—one which is workable; and there are two chief essentials of a good scheme:

In the first place, the scheme must provide work, and material with which to work, on a line with a pupil's present state of development. It is of the highest importance to graduate both work and material so that it shall be thoroughly suitable to the state of development of the pupil in question.

Secondly, the scheme must be in harmony with the pupil's surroundings—the work must be suited to the pupil's environment; and this brings me to the scheme

itself. I have heard it said—I have had it said to me—“Ah! yes, it is all very well for you with your college in the heart of the country; but what can one do in the heart of a large town—shut in on all sides by chimney-stacks?” But the beauty of nature-study is that it knows no limitation—it goes on for ever in city, town, and country. For example, if your school is in a seaport town, then make the students interested in all that pertains to a seaport—let them study the locks, seashore, fish, tides, waves, &c. If your school is in the country, then your work is light indeed. It is the easiest task possible there to infuse into the pupils a love of nature—there to follow nature and nature's ways in almost every direction. In the country Nature has surrounded us with her beauties—she has scattered her treasures lavishly in field and wood and hedgerow. Surely, then, we have ample material for nature-study and ample opportunity, and consequently it becomes to a greater degree our duty to study nature systematically. But in the country there is a great temptation merely to collect. Now making a collection has some value, but unless carefully watched this will make nature-study very superficial—nothing will be assimilated—and every day natural history is becoming more and more choked with unassimilated facts. Train the nature-student to work, and to think upon what he works.

But if your school is in the heart of a crowded city your task is more difficult—nevertheless, it is far from impossible. Nature-study can go on there just as freely as in the country; it is nature-study of a different type, but it is still nature-study. In this case a scheme may be drawn up by which the pupils shall study field botany in a public park or by means of flowers and plants grown in the school buildings or school garden. Plant life, animal life, and atmospheric phenomena may very profitably be studied. Even in the elementary school, where the intelligence is not of so high an order as in the secondary school, much useful work has been and is being done in the direction of nature-study, even in the busiest towns. There are, alas! only too many of us who have long outgrown our childish joy in the all-wonderful world around us. We should be, not only observers of nature, but sharers in its pure joy; as with Wordsworth :

“Nature never did betray
The heart that loved her: 'tis her privilege
Through all the years of this our life, to lead
From joy to joy.”

It would be impossible for me, here in this short paper, to give suggestive schemes suitable to the varying needs of various schools. I have merely shown that wherever the school may be situated—whatever be its circumstances—there nature-study can and should be taught. In a school this work should be both incidental and systematic. By incidental, I mean that no time is allotted to it upon the time-table—for much of a pupil's interest in nature is spontaneous, and this should in every way be encouraged. For the systematic work in nature-study, perhaps the best time upon the time-table is at the end of the morning or afternoon, after some fatiguing lessons. If you cannot set apart a separate time for it, then perhaps you could work it into the other lessons of the week. Doubtless many will consider that much of what I have said is more applicable to the elementary school, where one deals with younger children. That may be so, but I venture to say that a great deal can be applied to the secondary schools—for in the matter of nature-study we are all children, and in the case of schools where nature-study

has not yet been taken up, we cannot begin too simply. However, I will now say a few words suitable to those of riper years. I cannot do better than outline a scheme of my own, which I have for several years followed with no small success, and that with young men all more than eighteen years of age. My object has been to find out how far their powers of observation have been developed, and to train them to use their eyes properly—that is, I have made the nature-study work as heuristic as possible. For the first ramble I send them out singly—note-book in hand—in a certain direction for a certain time, and when they return they are to show me by their notes, specimens, and conversation what of interest they have seen. If I find any one student has not seen much, then I have my material to work upon—I have to show him how to see—I have more or less to direct his observations. If he has seen much, doubtless I find that he is more interested in one branch of natural history than in another, and so I let him, to a certain extent, specialise. For the second ramble I send them out in twos or threes, having made no preparation, but hoping they will show an improvement and make use of my little previous talk to them.

For the third ramble I take out the students in parties of ten or a dozen, and think aloud. This may seem a strange expression, but I will explain myself. I previously take a short walk (always short, for to take a nature-study ramble it is not necessary to travel miles—a few yards will often suffice), and take note of things likely to be of use to me. Then the students follow me—each has his note-book—he does not speak to me, neither do I speak to him; but I go along slowly, just as if I were alone, noticing things and thinking about them, reasoning and classifying—only I do it aloud. The students take note of what I notice, they see the way in which I attack the ramble, and see what use I make of my observations. When I return I put together all I have noted, and try to set my observations in some useful order. Then I discuss the ramble with the students. Now this may sound difficult, and I admit that it is difficult, but it is possible; and of the value of it I have no doubt. If anyone has not previously seen, he now sees, and sees more intelligently. For the fourth ramble I send them out in small parties in different directions, and the results of this ramble are generally very gratifying. On the fifth occasion I again take them out in parties, and direct their observations; this time I talk to them and they to me—in fact, we all learn together. I take them in a certain direction for a special object—it may be to study the structure and growth of various trees, or the flowers of the hedge, or the work and flow of a river, or the geology of the surrounding district. For the sixth and successive rambles I send the students out with special objects in view.

By this time all, or nearly all, will have shown a special liking for one branch of the study, and will have decided, under the guidance and with the sanction of the teacher, to follow out as far as possible research work (for such it really is) in one or more departments of natural history. All that remains for the teacher to do now is to direct the pupil's work—to help him in his difficulties and to suggest experiments which he might profitably carry out. It will be well now and again to send out each pupil for quite a general ramble, to prevent him from working in a groove. I feel sure that if the subject has been presented to the pupil in the proper way, there will be little for the teacher to do—enthusiasm will do the rest.

If you cannot spare time on the time-table for nature-study, then do as I have done—work it side by side with practical science. This can very easily be done if you

have a large class for experimental science—keep some in for science and send some out for nature-study. Next time change round. Keep a register of what each one has done, and you will find that in this way much good work will be done, both in science and nature-study.

I have said that enthusiasm will do most of the work for you. This is true, but sometimes *stimuli* are necessary. A few of these I will very briefly mention. If you have a school garden make use of it—let the pupils study the soil, the use of manures, the rotation of crops, &c. Do some indoor work, watch the growth of plants daily, study the germination of seeds, and such like. A nature calendar will be found very useful. It may be a printed calendar showing the flowers, birds, &c., which are likely to be found at certain times; but, better still, it may be simply a chart filled up day by day with the observations of the pupils. It may contain the name of a first appearance, showing where it was found, by whom found, and giving any remark which may be considered useful. A healthy rivalry will be set up—a rivalry which I have found of great value even in the case of young men.

An aquarium may be set up at very little cost. It may be looked after by two or three chosen pupils. Thus the development of fish, frogs, &c., may be daily studied. Similarly, a vivarium may be established, in which living specimens of flowers are kept. At the school keep a rain-gauge, a maximum and minimum thermometer, a wet-and-dry-bulb thermometer, and let the pupils make their daily observations and "plot" curves to show the variations.

Again, hold annually an exhibition of nature-study work. I have tried this and found it a great success. Various sections are formed, and each student enters for one or more sections. Entries for this exhibition should be made some long time previous, so as to ensure its being representative of, say, a year's work; otherwise it may develop into a show of things just got up for the occasion. Each exhibit must represent systematic work. These are only a few of the many ways in which nature-study may be encouraged—others will occur to the teacher as he proceeds.

I cannot conclude this paper without mentioning two dangers which may be encountered. In the first place, there is the danger of working in a groove: the teacher goes through the same course term after term, the pupils constantly go over the same ramble, with the result that the teacher and taught soon learn a long list of names but little about nature. Secondly, there is the danger of the exclusive use of superficial observations, which is disastrous. Observations are of very little value unless some real use is to be made of them.

I will conclude by quoting a golden rule: Never tell the pupils anything which they can find out for themselves. Let them learn by doing. When nature-study is taught from the book it becomes worthless as nature-study, even though interesting information is imparted. Let it be our aim, not to train botanists or geologists or zoologists, but to train men and women to be handy, thoughtful, accurate, and sympathetic. Let us cultivate that love of nature which has been the inspiration of much of our literature and art, and let us always remember that we must be nature-students before we can be nature-teachers. If we can arouse the enthusiasm of any to a better appreciation of the works of nature, we shall have accomplished a great deal; for surely the study of the facts of nature is a discipline which cannot fail to develop those mental powers which all lovers of education should strive to cultivate and strengthen.

HISTORY AND CURRENT EVENTS.

THE eighteenth century saw in England, as in Europe generally, a cessation of interest in matters ecclesiastical. History was concerned then either with dynastic struggles or with commercial and colonial rivalries. The consequence was that Europeans in general, and Englishmen in particular, forgot the ideals of the seventeenth and previous centuries, or regarded them as antiquated. It was then, if at all, that the various branches of the Christian Church, established or unestablished, became "tolerant" to one another, a tolerance which arose largely from indifference to the old questions of controversy. Among other things that were then forgotten was the fact that the ideal of all Churches was, or at least had been, to be a government of men, that is, to be a State. The Papacy and the Churches which regarded that institution as necessary to the Christian Church had forgotten it least, and as interest in religious matters awoke in England with first the "Evangelical revival" and afterwards with the "Oxford movement," we here came to realise, at least partially, that still, as of old, the Church is a State. It has laws, penalties, revenues, armies. It is aggressive abroad, it disciplines its subjects at home.

IT is for this reason—that the Church (however conceived) is essentially a State—that we do not consider it foreign to this column to remark on some phenomena that have attracted the attention of Englishmen during the year that is drawing to a close. When, in 1886, an Act of Parliament extended the legal hours of marriage in this country from 10 a.m. to 3 p.m., it was found that the law of the Church was thus different from that of the lay State, and, since the matter was ecclesiastically unimportant, there was no difficulty in the Convocations undertaking to bring the two once more into conformity. But this year the lay State has again changed the law of marriage, and the consequence is a controversy, partly theological in character. Between the various authorities who have spoken, it is not for us to decide. Whether there is a law of the Church of England separate from that of the State, whether, if so, it should or should not be altered, and, if not, what the legal results will be, are the matters most discussed. We are reminded of the time when the State had no law on marriage, when the whole question was left entirely to the Church, so that in a certain suit for a decree of nullity of marriage the King of England sought such a decree from the Pope.

AMONG the Churches of the Roman obedience, too, there have recently been developments which can only be understood when we remember the State nature of the Christian Church. In 1870, when the dogma of Papal Infallibility was defined and made a matter of faith, there were some who would not accept the dogma, and were therefore expelled from the Church as rebels. They form the "Old Catholic" party, and, since their original leaders have disappeared, do not seem to be of great importance. And now there seems to be another movement within the Catholic Church. Conflict has arisen between old and new methods of thought. The head of the Church has decided the dispute, and those who will not obey the constitutionally made law are regarded as rebels. Excommunication has again been employed. The rebels are outlawed, as we should say in lay matters. So began the conflict with Luther. So began the conflict with Döllinger.

THE "parliament of man, the federation of the world," has met and dispersed. Do the "war drums throb no longer"? Are the "battle flags furled"? Or are there

still "wars and rumours of wars," while "the end is not yet"? There have been many such disappointments. Dante in 1310 expected that Henry of Luxemburg, the Emperor Henry VII., would restore the Roman Empire to its former greatness and bring about the millennium. But the Empire for which he hoped was destined to sink still further, not to rise again. Dante's great enemy, Boniface VIII., had issued the Bull *Clericis Laicos* in 1296 to prevent, if possible, wars between Christian princes, at least at the cost of Church revenues. But Edward of England outlawed the clergy in reply, and Philip of France did worse. General Councils in the fifteenth century might end the Schism, but they could not reform the Church "in head and members," and the mediaeval Church went on to the catastrophe of the sixteenth century. Since that time States have become more separatist, and in the nineteenth century came to base themselves on nationality, a principle which does not tend to mutual love.

ITEMS OF INTEREST.

GENERAL.

SIR ARTHUR RÜCKER, principal of the University of London, will resign next September the position he has occupied for seven years with such conspicuous success. The following resolution has been unanimously adopted by the Senate of the University: "That the Senate have received with sincere regret the announcement by Sir Arthur Rücker that he wishes to relinquish office on September 30th, 1908, and record their appreciation of the great services he has loyally rendered to the University as principal since its reconstitution."

THE North of England Education Conference of January next is to be held at Sheffield. There will be two united morning conferences on January 3rd and 4th. At the first the subject will be the functions of a modern university, and it will be introduced by Prof. W. M. Hicks, F.R.S., Mr. J. H. Hichens, and Mr. A. Mansbridge; at the second the discussion will be on the mode of preparation of the primary teacher before entering the training college, and papers will be read by Miss Byles, Mr. A. J. Arnold, and Prof. Mark R. Wright. There will be four sectional meetings in the afternoon of January 3rd: (i) Medical inspection and treatment of school children in primary and secondary schools; papers by Drs. Clement Dukes and R. H. Crowley. (ii) The teaching of history; papers by Mr. H. J. Snape and the Rev. Prof. G. H. Godwin, of the University of Durham. (iii) Holiday and open-air schools; papers by Messrs. C. H. Wyatt and Ernest Gray. (iv) Compulsory attendance at evening schools; papers by Messrs. J. Crowther and J. H. Reynolds. Three sectional meetings will be held in the afternoon of January 4th: (i) Treatment of physically and mentally defective children and their after-care; papers by Miss M. Dendy and Dr. T. H. Openshaw. (ii) Housecraft in schools for girls; papers by Miss Maud Taylor and Miss Cleghorn. (iii) The cultivation of artistic perception in children; papers by Messrs. T. R. Ablett and J. A. Pearce. Prof. M. E. Sadler has accepted the position of president of the conference. Tickets of admission can be obtained free from the joint honorary secretaries, Education Office, Leopold Street, Sheffield.

A HOLIDAY course for foreigners will be held at the University of London in the summer of 1908, and will, as in former years, be under the direction of Prof. Walter Rippmann. The full course will last from July 20th to August 14th. The number of students must be limited if

they are to receive that individual attention which is necessary to make a stay in London profitable; students should therefore make early application, which should be written in English. Tickets will be allotted as applications are received. Distinguishing features of the course are the lectures treating of English literature, institutions, education, and art; the systematic study of English phonetics; the classes for conversation, reading, and choral singing conducted by trained teachers; and the organisation of excursions to places of interest in and around London. Students may present themselves for examination in written and oral English. The standard required for distinction is high, and a good certificate issued in connection with the London University Holiday Course is considered to be of real value in the teaching profession. Arrangements cannot be made for students who are only beginning the study of English and have no conversational knowledge of the language. Details of the lectures and classes, and forms of application for admission and for accommodation, may be obtained on or after April 1st. All communications referring to the holiday course should be addressed to the Registrar of the University Extension Board, University of London, South Kensington, London, S.W., and the words "Director of the Holiday Course" should be written in the top left corner of the envelope.

L'ENTENTE CORDIALE offers for competition among members of either sex of university colleges two scholarships of £20 each. The examination will be held on May 16th, 1908, and will be conducted by the Society of French Masters in England. The paper will consist of a passage of French to be translated into English and one of English into French, and of an essay or letter in French on a given subject. A scholarship will be awarded to the most proficient competitor of each sex, and the successful competitors will be required to attend at one of the French universities with which L'Entente Cordiale is in correspondence, either a summer course in 1908 or a regular session in 1908-9, and to undergo an examination at the close of the session should an opportunity be offered by the university authorities. Applications should be sent to M. Belfond, Broglence Villa, Melrose Terrace, West Kensington Park, W., on or before May 5th, 1908.

THE twelfth of the series of educational pamphlets being issued by the Board of Education deals with the education of the cottage and market gardener in England and Wales. In it Mr. T. S. Dymond, one of H.M. inspectors, who has special knowledge of the needs of our rural population, discusses the question so far as it concerns both the secondary and elementary schools in the country. Speaking of the rural grammar schools, Mr. Dymond says they have not done much in the past to promote rural prosperity; they have rather tended to educate their pupils out of rural industry than into it. What we need, if rural grammar schools are to afford some preparation for country pursuits, is that in all such schools the sciences should be taught in relation to rural surroundings. It is just as easy to teach the principles of science from examples which are familiar in the surroundings of the country school as from those which are not, while by doing so these principles are brought home to every boy because the illustrations appeal to him; and at the same time those of the boys who are to follow rural pursuits are obtaining knowledge about rural things which will be invaluable to them when they leave school.

MR. DYMOND thinks that, as a rule, practical gardening is not a suitable subject for secondary schools. What is

needed is a practical course of the physiology of plant-life in relation to the soil. The work in the laboratory should be accompanied by practical experiments in the field or garden. The students should unite in cultivating a botanical garden, and use the vegetable garden attached to the school for studying different methods of propagation and so on. Field experiments should be made to study soils and subsoils, and the character of the flora growing on different classes of land. The great difficulty in the way of introducing such work into rural secondary schools is, says Mr. Dymond, that the science masters have never themselves learnt what abundant illustrations for their science teaching the surroundings provide. The value of summer vacation courses at agricultural colleges as a means of remedying the defect is pointed out, but nothing is said as to the desirability of rendering more attractive the position of science master in such schools, so that it may be more worth while for teachers in this position to make sacrifices to qualify themselves in the directions indicated.

THE "Practical Guide to Schools, Tutors, and Educational Homes for Boys and Girls, in Great Britain and on the Continent," issued by Messrs. Truman and Knightley, educational agents, of Holles Street, Cavendish Square, W., should prove of assistance to parents and others whose duty it is to arrange for the education of children under their care. This comprehensive guide contains detailed information concerning more than 1,000 schools, prospectuses and views of which can be obtained on application to the agents. The guide is divided into ten sections according to the character and fees of the educational institutions dealt with, and each of these sections is subdivided according to locality. The particulars provided about the schools included in the directory are of a practical and helpful character, and should assist the inquirer to form a good idea of the educational facilities of the locality in which he is interested. The price of the guide is 6d., and copies may be obtained from the compilers.

NEW instructions with regard to the treatment of infectious diseases have lately been issued by the Prussian Minister of Education. Tuberculosis of the lungs and throat is now made a notifiable disease, and quarantine is made to extend to all places outside the school where infected children are likely to consort with others. Prophylactic measures are recommended to teachers; e.g., the serum treatment in case of exposure to diphtheria, and daily disinfection of nose, mouth, and throat in other ailments. Teachers and pupils are advised to consult a doctor in case of doubt about tuberculosis, so that the sputum may be examined. Instruction in the simpler matters of health is recommended to teachers of natural history. If they pay attention to the subject some of the knowledge they communicate will reach the home and lead to co-operation between school and home, a course greatly to be encouraged. Circumstances alone determine when a school should be closed. In a day school the step is often effective, but in a boarding school the result may be directly opposed to the expectation.

A TRUSTWORTHY coach to private students and useful material for modern language teachers are to be found in the interesting little French magazine entitled *L'Etudiant*, which is published in England on Fridays. Its price is 2d. Each number contains a copiously illustrated lesson in grammar, supplemented by a "missing word" exercise, and, further, a series of well-chosen sentences for translation into French. An English classic author is selected

for practice in continuous prose, a key to which and to the other exercises is given either in the same or the following number. Other welcome features are the concise study of celebrities of literature and science, selections from French poets and philosophers, tales of travel, a running novel, and helps in mastering difficulties of pronunciation. A translation competition takes place every month, and is open to all paying the annual subscription of 10s. Fuller particulars of the magazine can be obtained from M. R. Desouches, "Dunleary," Victoria Road, Sutton Coldfield.

IN the recently published special report on education in the north of Europe much praise is awarded to the Leaving Certificate examination in Sweden, especially for its flexibility and for the comparatively small amount of written work required. The former aspect is well illustrated by the choice of subjects for the essay in the mother tongue given at the winter examination, November, 1907: any one subject may be chosen: (1) the persecution of the Christians in the Roman Empire; (2) how Rome conquered Greece; (3) Napoleon I.'s personality; (4) the beneficial effects of the period of liberty on the internal development of Sweden; (5) description of some Swedish building of historical importance; (6) the main routes of international commerce in our days; (7) leguminous plants; (8) our most important iron ores and their utilisation; (9) what district of Sweden appeals most strongly to you?

A RECENT number of the *Education Gazette*, published by the Department of Public Education at Cape Town, refers to the need for economy in all educational work in Cape Colony. The directions in which economy is to be practised are indicated very clearly. In the first place, the *Gazette* states, it will not be possible to sanction increases to existing salary grants, nor will grants for additional teachers be authorised unless in exceptionally urgent cases. Similarly, in the establishment of new schools, it will be necessary to limit fresh grants to cases of crying need. As regards pupil teachers, no change will be made in existing grants; opportunity, however, can be taken in January, when new engagements can be entered into, to effect a saving.

IN regard to applications for new grants for rent, announcement is made that the Cape Education Department will continue to decline to give any direct assistance, even although in ordinary circumstances such aid might be justified. Where repairs are necessary, the expenditure has to be kept down to the lowest possible figure. Economy under the head of "general maintenance" is also said to be desirable. Long though this list is, it does not exhaust the cases where a lowering of expenditure will be looked for by the Department. Whatever the circumstances to which this need for rigid saving is due, we trust that economy will not be purchased at the expense of efficiency, and that the earliest opportunity will be taken to revert to the ordinary scale of increases in teachers' salaries.

AS we go to press the programme of the January conference of teachers arranged by the London County Council is not complete. We are, however, permitted to make a preliminary announcement. The meetings will be held on January 2nd to 4th inclusive. Among the subjects to be discussed will be "Nature-study and the Teaching of Botany," "Elementary and Higher Commercial Education," "Manual Work in the Lower Standards," and "Interesting Experiments in Elementary Schools." Appli-

cations for tickets of admittance may be made to Dr. Kimmings, Education Offices, Victoria Embankment, London, W.C.

MR. ROBERT MITCHELL, director of education at the Regent Street Polytechnic, London, has just been created a Knight of the Royal Order of the Polar Star by the King of Sweden. Such a decoration is a fitting recognition of the work done by Mr. Mitchell in the development of technical education in London. So successful has this work been, that it has frequently attracted the attention of educational authorities in foreign countries, who have sent representatives to study the system employed by Mr. Mitchell. The success attending Mr. Mitchell's work of more than a quarter of a century may be judged from the fact that at present the number of members and students is upwards of 17,000.

DR. G. R. PARKIN has issued a statement as to the operations of the Rhodes Scholarship Scheme during the year. It appears that the whole number of scholars at the beginning of the October term was 160. For the present year seventy-three scholars were elected, forty-five of whom were from the United States, eight from Canada, six from Australia, five from South Africa, five from Germany, and one each from Bermuda, Jamaica, Newfoundland, and New Zealand. Three States of the American Union failed to supply qualified candidates. The three scholarships provided for Rhodesia were not taken up.

MR. T. A. LAWRENSON, M.A., B.Sc., formerly of St. John's College, Cambridge, and at present headmaster of the Runcorn Secondary School, has been appointed headmaster of the Westoe Secondary School, South Shields.

SCOTTISH.

THE report on secondary education in Scotland which has just been issued is a particularly welcome document, as it clears up several questions that have for some time been in dispute. The new regulations as to grants for secondary schools are amplified and explained. Specialisation, after the intermediate certificate stage, is not only to be allowed, but will be encouraged. It is recognised that pupils at this stage are required at present to keep fully abreast of too many subjects, but there is small hope of general relief until the university bursary requirements are radically altered. As matters are really moving at last in university circles, the prospect of reform in the strongholds of mediævalism are not so hopeless as they seemed even a year ago. Attention is directed to the danger of overlapping that exists in certain populous centres where more than one authority is interested in the promotion of secondary education. This, however, is a danger on the right side, and, if there is only a sufficiency of funds, is no danger at all, but a genuine advantage. A majority of districts, especially in the sparsely populated areas, suffers from precisely the opposite defect—a single authority but an insufficiency of funds. The Department has already granted special subsidies to schools in such districts, but much more requires to be done before opportunity is equalised for the rural and town child.

THAT part of the report which deals with commercial education is by no means encouraging. Only ten candidates were presented for the commercial certificate, and only two passed. These results are so unsatisfactory that one is inclined to ask if there is not something wrong with the nature of the test set and with the whole scheme of commercial education laid down. Two passes in com-

mercial education in a country so dependent on its commercial prosperity as ours would look bad for our future trade if the certificates or the training on which they are given had any value. Let us hope they have not. Whatever blame is to be attached to the Department for the character of the commercial course, there can be no doubt whatever that, as the report states, the real onus must fall on our business men. "It may be doubted whether any real progress (in commercial education) can be hoped for until men of business realise that lads who become apprentices at fourteen years of age cannot possibly be expected to have received anything that is worth calling a commercial education, and that, if the prospective apprentice is to undergo any proper discipline of the right kind at school, he must remain there until he is seventeen, and must consequently have privileged treatment accorded him in respect of salary or position when he does enter an office." These words are the key to the whole situation. No inducement, but rather the reverse, is at present held out to our youth to remain at school. If they do, they find themselves playing the drudge to companions who left school years before them with little education.

MR. SINCLAIR, M.P., Secretary for Scotland, in presenting diplomas to more than two hundred school teachers attending Saturday classes at the Glasgow School of Art, referred to the work carried on in that institution. It is known and appreciated far beyond the bounds of the city of Glasgow. Of the many features of which the governors have good cause to be proud, the attendance of the school teachers in such large numbers must be one of the foremost. The enthusiasm, earnestness, and devotion of those who give up so much well-earned leisure to equip themselves more thoroughly for their work are highly gratifying to all who are interested in the progress of education. The benefits to the students themselves and to the country at large, not only of the work done, but of the example set in this respect, seem to Mr. Sinclair to be extremely high.

PRINCIPAL DONALDSON, in his opening address to the students at St. Andrews University, said that in Scotland the profession of teaching is likely to become much more attractive than it has been in the past. The Education (Scotland) Bill, which he confidently looked for next session, would secure for teachers fixity of tenure and a worthy pension scheme. If the conditions of service are made satisfactory in this respect there will be plenty of recruits to the ranks of the profession. Principal Donaldson is one of the few university professors who have maintained a close personal association with the general body of teachers. On several occasions he has rendered signal service by taking up the cause of his less fortunate brethren, and teachers have always listened with respect to his opinions. They trust his optimism on this occasion may be justified by events. All the same, it will be well for ambitious youths to delay rushing into the profession until some of these rosy visions have taken more definite shape; otherwise they may find themselves numbered among what Bismarck called the *Abiturienten Proletariat*.

THE Scottish Art Teachers' Association, with the approval of the Education Department, has resolved to organise a national exhibit in connection with the International Congress for the Development of Drawing and Art Teaching, which is to be held in London in August, 1908. For this purpose it is proposed to have a preliminary exhibition in Edinburgh during the Christmas holidays. In order to make this exhibition representative

of the whole range of drawing and art teaching in Scotland and to ensure the success of the congress exhibit, the committee in charge is asking for the co-operation of all parties interested. The range of work will embrace specimens from all classes of schools—kindergarten, elementary, secondary, continuation, and technical.

THE success of the proposed Technical College for Aberdeen is already assured. Including the £40,000 promised by the Education Department, upwards of £100,000 has been obtained. The question of the annual maintenance of the college has been agitating the promoters of the scheme. Dr. Struthers at a recent conference with them was able to assure them on this head. He reminded them that in the recent Education Bills for Scotland ample provision for such institutions was made, and he believed that any future Bill would make similar provision.

DR. ARTHUR SOMERVELL, inspector of music to the Board of Education, gave an address to the Edinburgh Musical Association in one of the class-rooms of the University. Dr. Somervell said that music is treated too much as innocent recreation, and is apt to be shoved into a corner in these strenuous times. But music, rightly considered, is one of the greatest harmonising and humanising influences in the world. Music is the earliest and easiest means at our disposal for cultivating sensitiveness to the higher rhythms and producing imaginative power. Everything in the universe acts in and through rhythm, and responsiveness to music is the outward and visible sign of an inward sensitiveness to this rhythm in all things.

IRISH.

THE autumn meeting of the Schoolmasters' Association was mainly devoted to questions concerning the intermediate rules and programme, but two other subjects were introduced by Mr. Houston, of Coleraine School. One was a proposal to give a favourable reception to the appeal of Lord Roberts to have all the youth of the country instructed in military drill and in the use of the rifle, and to consider its introduction into all Irish secondary schools. This was adopted. The other was a suggestion to introduce Esperanto as a subject of school education, and this was less favourably considered and postponed for a year. The association is strongly opposed to the rules and programme for the current year, and is anxious that those for 1909 should be submitted to the consultative committee before being laid on the table of the House of Commons. The award of exhibitions and prizes is criticised on the ground of the inequality of their allocation to the different courses; thus classics receives, boys £815, girls £47; modern literature, boys £1,697, girls £1,309; mathematics, boys £537, girls £15; experimental science, boys £1,072, girls £303. The association further disapproves of the admission of candidates from the national schools without experimental science to the intermediate examinations, and urges upon the Board to use more economy in the use of its funds, so that a larger percentage may reach the schools.

THE Teachers' Guild has also forwarded a memorial to the Intermediate Board dealing with the recent award of exhibitions and prizes. It points out, first, that the number of exhibitions has been largely reduced, and, secondly, that the values are diminished. It then shows how the amount awarded in exhibitions per student passing the examinations has gradually decreased during the last five years, being in 1903 £1 9s. 6d., in 1904 £1 2s. 6d., in

1905 £1 1s. 2d., in 1906 17s. 11d., and in 1907 12s. Taking exhibitions and prizes together, it then shows that the higher the grade the smaller the total amount awarded, while the amount per student is actually less in the junior than in the preparatory grade, being 11s. 9d. in the junior and £1 in the preparatory; and it suggests that, as the amount of the preparatory grade prize fund is definitely fixed at £1 for every student passing, so in the other grades there should be a definite amount awarded per pupil, and that if the total amount must be lessened, the decrease should take place in the prize funds and not in the value and number of the exhibitions.

THE Guild has also forwarded a memorial to Mr. Birrell pointing out how seriously the work of the schools is hampered by the unsatisfactory nature of the grants. There has been a drop from £38,000 to £50,000 in the last three years, while the number of pupils presented for the examinations continues to increase. The average grant per pupil has fallen from £7 5s. in 1903 to £4 5s. in 1907, while it is pointed out that in England and Wales the grants from the Board of Education increase from year to year in their total, and in the present year are being made upon a much more generous scale per pupil; and again, there are no local grants in Ireland, while in Wales alone the local grant amounted in 1904-5 to £96,660, or nearly twice the sum received by all Irish schools from the Intermediate Board. It is suggested that the change in the system of grants foretold last Easter by the Chancellor of the Exchequer offers an opportunity for reconsidering and enlarging the grants to Irish secondary schools.

THE provisional committee of the Classical Association for Ireland is well pleased with the result of the circular sent out in the autumn. It has received sufficient support to justify its proposal to start an association, and it is arranging to hold its first general meeting in January in Dublin. Dr. Butcher, M.P., who has consented to act as chairman of the association for the first year, will preside. The cause of classical studies seems likely to revive in Ireland, as classical societies are being formed in several of the university colleges. That in Trinity College entered on its second year in November, when a lecture of remarkable interest was given under the presidency of Dr. Tyrrell by the Right Hon. Mr. Justice Madden, Vice-Chancellor of the University of Dublin, on early classical studies in Ireland, with special attention to the sixteenth century.

MR. BIRRELL has more than once in the last two months definitely declared his intention next year of introducing into Parliament a University Bill to satisfy the claims of Roman Catholics to higher education, but he has also given a clear warning that, although he is willing to stake his political career on this question, it can only be settled by a willingness on all sides to make concessions, and unless this is shown there will be no University Bill in this Parliament. It is hoped that this will be taken to heart, as everybody now desires the matter to be closed. The grievance is genuine, and is doing much mischief to the country. It is well sometimes to remember the saying that "the best is the enemy of the good." That the demand for higher education is increasing is clearly demonstrated by the numbers entering for the examinations of the Royal University. They were 1,898 in 1881-2, 2,804 in 1902, and 4,115 in 1907. At Convocation the Chancellor laid down certain factors as desirable for a satisfactory scheme of university education: (1) the safeguarding of

religious desires; (2) encouragement of emulation between different universities; (3) the combination of residence, teaching, and examination so far as possible; (4) cheapness of education; and (5) an effort to provide work for graduates.

THE second number of the *Irish Educational Review*, that for November, is interesting reading. The first article is by the Bishop of Limerick, on the Queen's Colleges; the second is in Irish; and others deal with changes in primary education in Ireland, the training of the voice, the philosophy of Herbart, school attendance, the teaching of history, and education as a science.

THE fourth number of vol. vii. of the Journal of the Department of Agriculture and Technical Instruction is extremely good reading; it contains more than 200 pages with numerous illustrations, and is published at 6d. It appeals to all interested in education, fishing, or farming, using these words in their widest sense. It contains in full the first vice-president's farewell address to the council; the address of Mr. Fletcher, the assistant secretary, delivered to the Council of Agriculture, on "The Functions of the Department in Relation to Rural Industries"; and Mr. W. S. Green's official report on the question of a Government brand for fish cured in Ireland. It has also a summary of the Workmen's Compensation Act of 1906, and articles on Winter and Summer Dairy Farming, the Construction of Piggeries, the Cost of Forest Planting, the Prevalence of Potato Blight, Duck-keeping as an Industry, the Cultivation of Osiers, and Cider-making. The second of the illustrated articles on technical schools deals with Ballymoney. The first was on the Belfast school, the largest in Ireland; the second shows what is being done in a small town of some 3,000 inhabitants. The site was granted by Lord Antrim at the rent of 1s. per annum. The building was erected at the cost of £1,500, secured on the rates. The estimated income is £420, and expenditure £471, while there is an accumulated fund of £1,483. The principal rooms are for manual instruction, domestic economy, science laboratory, and art instruction. The equipment of the school cost nearly £1,300. The total number of students for last session was 237, and these took 487 classes.

WELSH.

THE tenth annual report of the Central Welsh Board for Intermediate Education has been drawn up for the year 1906-7. There are ninety-five county schools in Wales, under the charge of seventy-four headmasters and twenty-one headmistresses. There are 266 assistant-masters and 262 assistant-mistresses on the staffs of the schools. This shows an increase of nineteen masters and nineteen mistresses as compared with last year. There is thus in the Welsh county schools a total of 623 teachers. There are in the schools thirty trained certificated teachers, seventy-four certificated teachers, fifty-four teachers who hold the Cambridge University diploma, four teachers who hold the London University diploma, and eighty teachers who hold teachers' diplomas or certificates from various other sources.

THE total number of pupils in the Welsh county schools is 11,577, viz., 5,648 boys and 5,929 girls. The total number in 1905 was 10,413, thus showing an increase of 1,164. With regard to the examinations, it may be mentioned that the average cost per school is £31 2s. 8d.; the average cost per school of inspections is £20 3s. 9d., whilst that of the administrative work of the Board is

£19 10s. 3d. Thus the average cost per school of the examination and inspection (together with necessary administration) comes to £70 17s.

In the general report of the Board it is hoped "that no effort will be spared to ensure that the provision of education of a true secondary type shall be ample to meet all needs, both in accommodation and equipment." Attention is directed to the increasing correlation with the home environment of the Welsh child. "One pleasing symptom of this development is shown in the fact that the number of children studying Welsh in the county schools has doubled during the last two years."

THE following passage is an interesting summary of the place of the Welsh county school: "It cannot be doubted that much of the marvellous success of the Welsh county-school system has been due to the historical unity of the schools and to the resultant position of strength which they occupy in the imagination and regard of the Welsh people, forming one whole in the national life. The schools stand before the nation not as weak and isolated units, or as small and unrelated local groups, but as one system with common aims and aspirations, combined with much freedom of individual development, and unified through a public body, whose members are in close touch with the governing forces of the national life."

THE average length of stay in county schools by pupils is improving. In 1904, 345 per thousand pupils stayed over six terms; in 1905 the number was 358 per thousand. The length of stay has improved in thirteen out of the sixteen counties, and the slight decline in the remaining counties is due to the very large increase in the number of pupils in those counties.

ONE of the most important recent suggestions with regard to the county schools is that of regarding the county rather than the school as the unit for the purpose of a complete curriculum. The report of the Central Welsh Board points out that, in so far as the older departments of the curriculum are concerned, the differentiation of schools would be a very difficult problem. "There is, however, no reason why some progress should not be made in respect of commercial and technical departments. If the highest work that can reasonably be attempted in schools is to be successfully accomplished in these departments, it would appear to be necessary to designate a few schools for that highly specialised work."

IN addressing the meetings in connection with the opening of the Edward Davies Chemical Laboratories at Aberystwyth, Mr. Asquith, the Chancellor of the Exchequer, showed great insight into the educational system of Wales. He appreciated the fact that the university system in Wales had been undertaken by the people for the people. Within the last thirty years, for instance, nearly £120,000 had been subscribed for the University College at Aberystwyth, and this sum had been contributed by 100,000 separate donors. During the same period a sum of between £80,000 and £100,000 had been contributed for the intermediate schools. He added very suggestive advice: "Money was needed, not for the remission of fees—fees are very low in Welsh colleges—but for improved equipment. They could not save more improvidently than by stinting and starving their educational equipment, and the danger was of spreading out the curriculum too widely. He who strives to embrace too much grasps very little. At the present time it would be wise to aim at greater concentration and co-ordination."

RECENT SCHOOL BOOKS AND APPARATUS.

Modern Languages.

Vivent les Vacances! By Clémence Saunois. vi+90 pp. (Blackie.) 1s.—Miss Saunois has already made her début with her attractive book "L'Anniversaire de Blanche." In the present volume she again shows her skill in writing lightly and pleasantly of girls, and for girls. The scenes are animated and natural, and gain not a little from the really excellent pictures by Mr. (or Miss?) R. Hope. The notes deal largely with the position of pronouns in French; in some cases French expressions are rendered in English. This occasionally goes too far, as in the note "*Elle a trois ans*—She is three years old." A vocabulary is also given. The text is well printed; we have, however, noted a dozen slips in the punctuation.

Molière, Les Femmes Savantes. Edited by F. Spencer. xvi+144 pp. (Dent.) 1s. 6d. net.—We are glad to see that Dr. Spencer is continuing his edition of Molière's plays, for he has long been a devoted student of Molière, and his fine scholarship and admirable reserve fit him perfectly for the work. His preface, glossary, and notes on "Les Femmes Savantes" could not easily be surpassed.

Labiche et Delacour, La Cagnotte. Edited by W. O. Farnsworth. ix+134 pp. (Heath.) 1s. 3d.—Is this really the kind of thing we want to read in class? It is probably all right on the stage, where the broadly farcical has its occasional justification; but in print the caricatured creatures, with their vulgarity and slang, become almost repulsive. The notes are good on the whole; if the text supplies French slang the notes give American equivalents, and so our pupils will get a pretty extension of their vocabulary from reading this book.

A First German Course. By J. B. Joerg and J. A. Joerg. 192 pp. (Cassell.) 1s. 6d.—According to the authors, "the method followed is a middle course between the old system and the new one," and we also meet with the familiar phrase, "we have endeavoured to take the best points of both methods." These professors usually cover a good deal of *old* and not much *new*. In the present instance we have translation everywhere; no end of grammar; a very large number of words. There are excellent illustrations, worthy of being put to a better use. The vocabularies at the end are incomplete; as it is, the German-English contains 1,800 words, which is far more than ordinary pupils can learn in a year. The book cannot be regarded as representing any advance in method.

Classics.

Cothurnulus. Three Short Latin Historical Plays for the use of beginners, with Vocabularies. By E. V. Arnold. iv+56 pp. (Bell.) 1s.—Why could not this book have been better sewn? is our first question: it will not open, and only yields to violence. Once open, however, we are highly pleased with the contents. The plays are "Veturia" (on the story of Coriolanus), "Idus Martiae" (on Julius Caesar), and "Cremutius," one of the tales of Tiberius's rule. The Latin is simple, the action dramatic, and the book as a whole admirable. Just this is the kind of book we now want for young beginners in Latin; and we recommend it cordially. We can also testify from experience that the plays act well on the stage. It is a great pity, however, that the long vowels are not marked.

A First Latin Grammar. By E. H. Scott and F. Jones. viii+150 pp. (Blackie.) 2s.—This book gives, not a complete grammar, but the minimum that everyone must

know. It is very good, in our opinion, in what it inserts, and generally in what it omits. We think, however, that the distributives ought to be in it. The distinction of hypotheses into open and rejected clauses is simple and useful, because it explains itself. The pages of examples on uses of cases, pronouns, and prepositions are also very good. We are inclined to prefer an interleaved book with fewer examples; but all do not think alike on that point.

T. Macci Plauti Mostellaria. Edited with Notes, explanatory and critical, by Prof. E. A. Sonnenschein. Second edition, interleaved. xxii+176 pp. (Clarendon Press.) 4s. 6d.—Good school books are so few that this, although the second edition, deserves mention. The editor is one of the first Plautine scholars, and keeps well abreast of scholarship; and Plautus, if any author, needs notes. The play itself is excellent, and there is very little in it which is unsuitable for young readers.

Virgil's Aeneid, Book X. Edited by H. B. Widdows. xxii+80 pp. (Dent.) 1s. 4d.—Little need be said about this edition, which is very much like others. It has the usual introduction and notes, which, as usual, contain a great deal of translation. Nearly all these translations are unnecessary, and, if so, they are bad educationally. There is a vocabulary.

Preparatory Caesar: de bello Gallico. Books II.-III. By F. Ritchie. viii+159 pp., 1s. 6d. The same, Book III. alone, 1s. (Longmans.)—Besides the usual introductory matter on Caesar, Gaul, and the Roman army, and a few sensible notes, this book contains the text of II.-III., and on the opposite pages the same simplified. The simplification consists of a restatement in simple sentences of what Caesar expresses by complex sentences. The plan is very good; the only question is whether it would not be better for the master to do this in class as a preparation for the next day's work, and the answer to that question depends on the age of the pupils and their knowledge. If boys begin Latin young, and if Caesar is their first author, they could not do better than to use Mr. Ritchie's edition.

Latin Exercises on Latin Models. By A. C. P. Lunn. 96 pp. (Arnold.) 1s.—This seems to us to be a useful and original exercise book. On one page are Latin sentences with references; on the other, English sentences of similar types for translation. A few grammatical questions are added to each exercise, deducing the rules of syntax from the examples.

English.

The Cambridge History of English Literature. Vol. i. From the Beginnings to the Cycles of Romance. 504 pp. (Cambridge University Press.) 9s. net.—This work, which promises to be great and very important, is edited by Dr. Ward, the Master of Peterhouse, and Mr. A. R. Waller, of the same college. Throughout the volume, intentionally or not, the editors' hand or their fiat is seen; with the exception of one chapter, the book might have been written, so far as its style goes, by a single scholar. Style, indeed, it has none: and it aims at none. It is a laborious, informing, Teutonic monument of all that specialists know about the actual facts of our literature down to the times of Chaucer and his forerunners. Very occasionally are the learned writers of the various chapters betrayed into any note of admiration or even of appreciation; and the only one of the contributors who seems for a moment to take his subject cheerfully and lightly is, as we should expect, Prof. Saintsbury. There are, on the whole, few quotations; pictures and all illustrations are

absent. From this it will be seen that the book, and consequently its successors, are not for the multitude. It is a literature for scholars; and, one must add at once, it is a splendid production. The chapters are taken by writers who have made the particular sections on which they write their own; but the nomenclature of the chapters is new and free from the hide-bound divisions we are accustomed to. The Runes, Old English Christian Poetry, English Scholars in Paris, Anglo-French Law, do not usually find their true places in English literature, and the appendix on early prosody, which the editors found was necessary, is admirable. The chapter on the Arthurian Legend (pro-Celtic) and that on Old English Christian Poetry seem to us to be the least bookish and the most stimulating parts of the book; but the preface to the whole clearly points to the scope and intention of the volume. The bibliography is beyond praise; and scholars like Stephens, Thorpe, and Budinszky, unmentioned in the text, receive their recognition. Perhaps the volume may excite some enterprising publisher to find an adequate "translator" of some of our older work: for, with bated breath be it said, Beowulf has not yet come to his own. The print and binding are handsome, and the book is cheap.

The Use of Life. The Pleasures of Life. By Lord Avebury. (Macmillan.) 2s. net each.—Most of us know these delightful books, and they have long been popular with many classes of readers. In their new form—the pretty Pocket Classics edition—they will secure many more readers, and we doubt not do a great deal to sweeten many more lives.

Chaucer's Prologue, Knight's Tale and Nun's Priest's Tale. Edited, with Introduction, Notes, and Glossary, by F. J. Mather. "Riverside Literature Series." lxxix+172 pp. (Harrap.) 1s. 6d.—This edition has a good introduction, a few notes, and a very full glossary.

The Myths of Greece and Rome: their Stories, Signification, and Origin. By H. A. Guerber. xiii+395 pp. (Harrap.) 2s. 6d. net.—The idea of retelling the ancient myths with the help of frequent quotations from the English poets who have used them is an excellent one. It is a pity that Mr. Guerber's own style is far from faultless, and his taste in poetry not exacting. To call such a verse as this a translation from Pindar is an outrage on a great poet:

"They till not the ground, they plough not the wave,
They labour not, never, oh ! never !

Not a tear do they shed, not a sigh do they heave !
They are happy, for ever and ever !"

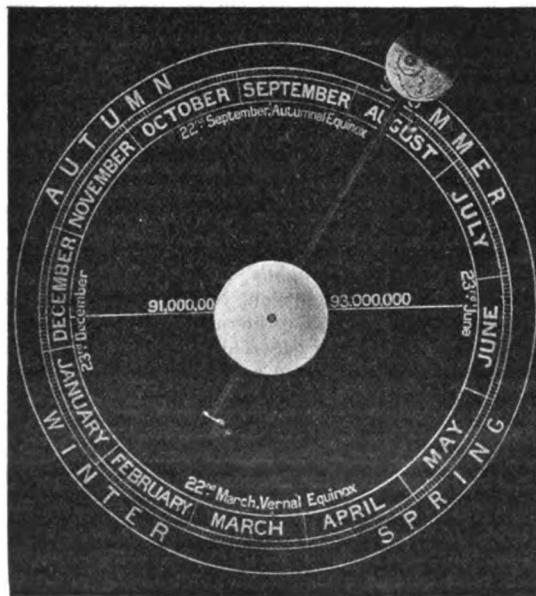
The "reverence due to boys" (and girls) is preserved, as is well, but not always happily. "The sun-god wooed the girl warmly and persistently, and at length had the deep satisfaction of seeing his affections returned"—better the baldness of Lemprière, one would say, than this sort of stuff. The same criticism is provoked by some of the reproductions from modern paintings. Otherwise, high praise is due to the excellent copies of many famous pictures and statues. Indeed, the publishers offer an amazing amount of good print and good illustrations for the money.

Geography.

The "Day by Day" Tellurian and Calendar. (Philip.) 30s. net.—The simplest way to illustrate the changing illuminated hemisphere of the earth throughout the year, and therefore the cause of the seasons, is to place a lighted lamp upon a table and carry round it a globe having its

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axis pointed in a constant direction. This method is to be preferred to any complicated Tellurian or Orrery, in which more interest is attracted by the mechanical devices which produce the various motions than by the motions themselves. A disadvantage of the lamp-and-globe method and of a Tellurian is that a class cannot easily see the different aspects presented by the earth to the sun at different times of the year when the revolution of the earth takes place in a horizontal plane. This difficulty is removed by the "Day by Day" Tellurian, which is arranged so that the plane of the earth's orbit is vertical; and the sun and earth are therefore seen as if the observer were looking down upon them from a point above (that is, north of) the orbit. The sun is represented by a ball slightly out of the centre of the orbit, and a 6-inch globe represents the earth, the two being connected by an arm, so that the earth may be shown revolving around the sun. By a simple and ingenious device, the axis of the earth is kept in a constant direction during the revolution, so that the aspect presented by the earth to the sun



The "Day by Day" Tellurian.

at any time of the year is accurately shown. The Tellurian, which measures 48×55 inches, can be set up or taken to pieces in a very few minutes, but it may be fixed permanently upon a wall, and the terrestrial globe moved day by day in conformity with the movement of the earth. Used in this way, the model may be made very instructive, and would be a valuable addition to the equipment of a geographical laboratory. Where it is possible to substitute an electric lamp for the globe representing the sun, the exact conditions of illumination throughout the year can be exhibited, and the value of the apparatus will be greatly increased.

Mathematics.

A Modern Arithmetic with Graphic and Practical Exercises. Part i. By H. Sydney Jones. xii+361 pp. (Macmillan.) 3s.—It is stated in the preface to this book that in it an attempt has been made to provide a course of work in which the essential parts of arithmetic are dealt with in the spirit of recent recommendations. The attempt seems to us to be very successful. The expository

parts of the book are clear and reasonable, while the exercises are exceedingly varied, free from unnecessary complications, and yet of sufficient difficulty to call forth the best efforts of the average pupil. The graphic work does not consist of exercises in plotting points, but is employed, not only to illustrate the meaning of arithmetical processes, but to give practice in estimating areas, and is usefully conjoined with scale drawing. The present volume covers the subjects prescribed for the Oxford and Cambridge Junior Local examinations in arithmetic and other examinations of about the same scope. We think the book well deserves the consideration of teachers in search of a work that is suited to present needs. The volume is provided with answers and—a feature that is too often absent—a good index.

The School Arithmetic. By W. P. Workman. Second edition. viii+547 pp. (Clive.) 3s. 6d.—The first edition of this arithmetic was noticed in *THE SCHOOL WORLD*, vol. v., p. 473. In this edition the only changes seem to be the addition of two chapters on logarithms and graphs respectively.

Graduated Long and Cross Tots. By C. E. Town. 64 pp. (Commercial Education Department, London Chamber of Commerce.) Paper covers, 6d. net.—The exercises provided in this collection seem to be well graduated; if used in the way suggested by the compiler they should go far to produce both speed and accuracy in the kind of arithmetical work with which they deal. The examination papers included in the collection will be useful to many.

The Methodical Arithmetic. By W. J. Greenstreet. Parts ii. and iv., each 24 pp. (Dent.) Paper covers. part ii., 1½d.; part iv., 2d.—Parts i. and iii. were noticed in *THE SCHOOL WORLD*, vol. ix., p. 437; parts ii. and iv. seem to possess the same characteristics as those previously under notice.

Science and Technology.

The Bird Book. By Fannie Eckstorm. xii+281 pp. (Harrap.) 2s. 6d.—British readers of American books on natural history often find a difficulty in recognising, under the names employed, animals common in this country as well; we fear the usefulness of the excellent volume before us may also be impaired for this reason. It would surely be easy in such cases to include a table of synonyms in the English edition. "The Bird Book" is well written throughout, but its special value lies in the clear treatment of some questions of structure and general problems of bird life—interesting subjects quite within the comprehension of young students, but not often discussed in so elementary a book. A full index is provided.

School Hygiene. By Herbert Jones. x+151 pp. (Dent.) 2s.—This little volume may be recommended cordially to the notice of teachers and school managers. The first half of the book deals with the essentials of school planning, the second with the means of securing the personal health of the scholar. It is clearly and simply written, and adequately illustrated. Mr. Jones is obviously an authority on his subject.

The Microscope and How to Use it. By T. Charters White. x+159 pp. (Robert Sutton.) 3s. net.—Beginners in microscopical technique who have not the advantage of direct help from an expert can scarcely select a more concise and trustworthy guide than this little book, now in the third edition. The inclusion of a section by Mr. M. Amsler, on the staining of bacteria, and of a chapter on the marine aquarium, adds considerably to the utility of the book.

Science through Stories. By Constance M. Foot. 113 pp. (Charles and Dible.) 1s. 6d. net.—These stories are intended as a vehicle for the introduction of very elementary science to children of from six years of age. They seem well adapted to the purpose.

Forms for Plant Description. By E. Evans. (Colne : B. Ingham.) 6d.—Will be found useful to candidates for the first-stage examination in botany of the Board of Education.

Art.

Nelson's New Drawing Course, Stage VI. By J. Vaughan. Ten sheets, 24 x 20 in., in portfolio. 15s. Teacher's Handbook. 87 pp.; plates and diagrams. 2s. 6d.—In Stage VI. of his "New Drawing Course" Mr. Vaughan has evolved an excellent scheme, ideal in many respects, which, if carried out conscientiously and in the spirit of the author's intention, will go far towards the realisation of the desire expressed by him in the introduction to the handbook, that is, to make the subject "an enjoyable, stimulating educational process, and a real training of hand and eye."

To map out successfully a scheme for a course of instruction in drawing is a matter which involves intimate knowledge both of the subject and of the conditions under which it is taught. To carry out such a scheme to a satisfactory conclusion in the face of all difficulties of administration and organisation, of unequal classification and inefficient accommodation, involves not only knowledge and experience, but also enthusiasm, endless patience, and an untiring industry. The success or failure of this scheme of work depends therefore almost entirely on the teachers to whom will fall the task of administering it. In his introduction to the handbook (which to our mind is the far more valuable part of the publication), Mr. Vaughan lays down the general principles on which his scheme is based, and discusses the relation of drawing to the other forms of educational handwork. Under the heads of "Free Drawing," "Mechanical or Technical Drawing," and "Manual Training," he discourses on methods, styles, materials, and so forth with a facile pen, and though his remarks may be occasionally trite, they are generally to the point and always interesting.

The suggested solution of the difficulties presented by an elliptical object seen in perspective strikes one as being scarcely convincing, and one sees little to choose between the method Mr. Vaughan advocates for the drawing of Fig. 1 on plate vi. and the method he condemns, the only apparent difference being that he would begin at the bottom, whilst by the other method one begins at the top. The illustrations and plates, which are numerous and well reproduced, are intended merely to illustrate the principles laid down; indeed, to quote again from the preface, "it may almost be said that the measure of success attained . . . will be in direct ratio to the degree in which teachers put *themselves* into the work." The "New Drawing Course" may be warmly commended, not only to the primary-school teachers for whom it is evidently intended, but to the teachers of drawing in secondary, technical, and other schools of a more advanced type.

The Vistaplane; an Aid to the Teaching of Model Drawing. (Henry G. Murray, Britannia Studio, Caroline Street, S.W.) 6d.—This device must, we fear, be placed in the category of mechanical aids to drawing which modern expert opinion on art teaching tends to taboo. It is, nevertheless, an ingenious contrivance, consisting of a circular disc of glass, 4 in. diameter, with a small handle

to permit of its being held between the eye and the model in the position of a picture-plane. By means of horizontal and vertical lines ruled on the glass, the student is enabled to ascertain the apparent inclination and convergence of receding lines. Teachers and students who feel the need of this sort of assistance will find it provided in the "Vistaplane" in a very portable and inexpensive form.

CORRESPONDENCE.

The Editors do not hold themselves responsible for the opinions expressed in letters which appear in these columns. As a rule, a letter criticising any article or review printed in THE SCHOOL WORLD will be submitted to the contributor before publication, so that the criticism and reply may appear together.

Chemistry as a School Subject.

In his withal valuable article under this title, Dr. Cohen criticises adversely certain malpractices of the schools from observations which he has made as an examiner; and he cites them as arguments why, in his opinion, when a boy is destined for a scientific career, systematic chemistry teaching should be postponed until a foundation in the simple branches of mechanics and physics has been laid. It is curious that he should limit his argument to the boy destined for a scientific career and it is not clear what he means by the systematic study of chemistry—whether he contemplates an unsystematic chemistry being taught with advantage. There are few who understand the subject who will not agree with his individual criticisms; but surely they go only to show that there are wrong ways of teaching the subject which are to be avoided—not that the subject is a bad one.

If the teaching of each subject in the school curriculum were considered in a similar manner, similar adverse conclusions would be arrived at; the result would be the decision that no subject is a sound discipline and that there should be no teaching at all—a happy result perhaps, as there could then be no examinations and Nature would not be interfered with. In point of fact, the statement that chemistry does not admit of simple and logical treatment is the most unwarrantable and ill-advised assertion a chemist could possibly make: it is to be feared that Dr. Cohen has not yet grasped the situation and that he is not in the least alive to the infinite opportunities which the science he professes affords of developing a scientific habit of mind. His article, indeed, is most interesting as a psychological study—a clear illustration of the difficulties to be overcome by the teacher of scientific method.

CHEMIST.

AN article in the November number of THE SCHOOL WORLD raises an important question—How far is chemistry suitable as a school subject?—a question on which I trust many of your readers who have had experience of the value of scientific training will give their opinions. The writer, it is to be noted, writes, not as a teacher, but as an examiner, and, it may be added, as a professor. For it is a striking fact that each professor wishes us, in our schools, to teach all but his own subject; the professor of chemistry tells us to teach mathematics and physics well, mechanics, hydrostatics, pneumatics, sound, light, and heat, and he can teach the chemistry; the professor of physics would have us send him pupils who have a thorough knowledge of chemistry, mathematics, French and German (to enable the student to read foreign publications), and he would like physics to be a sealed book;

and so on in all subjects. This is easily understood. It must be delightful to have pupils with a good knowledge of all things except that which you want to teach them; the results of one's work are so obvious and the difficulties so microscopic. A headmaster cannot tell, however, which of his pupils will specialise in chemistry, which in physics, which in modern languages, &c., and before he discovers, the mischief is done, and the pupils have been taught in school something of those subjects in which they are to specialise.

With regard to chemistry as a school subject; as in the first place a man cannot claim to be educated who has not some knowledge of the elementary principles of chemistry, it is necessary that it shall have a place in the curriculum of the school, whilst, further, it is a most valuable subject for the training of scientific method. Although I am prepared to admit that it is more difficult to teach than elementary physics, yet I believe that, well taught, it is quite as valuable, and for the training of reasoning is better than any other school subject. With regard to the objections raised in the article in question, I should like to treat them seriatim, because they appear to me to be difficulties due, not to the subject, but merely to the method of treating it. A teacher working in accordance with the syllabus published many years ago by the Incorporated Association of Headmasters or the syllabus of the Irish Intermediate Board would not experience them. The first point raised is the difference between the behaviour of chalk and zinc when heated. If the experiments were done on two successive days it is probable that the student would be perplexed; but the heating of zinc should be merely one stage in the systematic study of the rusting of metals, and the fact should have its proper place in the boy's mental equipment. The endeavour to obtain oxygen from the rusts—which are known to contain it (though not known by this name—it is probably the active part of the air) leads to the further heating of the rusts, and the discovery that mercury rust is decomposed on further heating. This is quite easy for the boy to understand; he has no difficulty in it, though a professor could, perhaps, raise one in his mind. Heat accelerates the action—that is his idea—it may produce a synthesis or a decomposition. Later work gives him many illustrations of both.

That the gas comes from the chalk and not from the acid should not be mysterious—he proves it does so, and the proof forms a most valuable training in reasoning: (i) the loss in heating is 44 per cent., (ii) the loss by the action of acid is 44 per cent.; therefore *probably* the loss is due to the same gas; by collection of the gas obtained by both methods the identity is demonstrated. That the gas in the case of the zinc and acid came from the acid would have been indicated (this at an earlier stage) by the fact that by thoroughly heating the product left after the action, oxide of zinc results. The difficulty raised here does certainly indicate a rather widespread failing of teachers, viz., the neglect of the examination of *all* the products of a reaction.

With regard to the composition of water, I agree with Prof. Cohen that the electrolytic decomposition is unsatisfactory—if only because it is a secondary reaction, and because it tends to false reasoning—but it is unnecessary. The composition is known (i) qualitatively by burning hydrogen, and (ii) quantitatively either by volumetric synthesis or by passing hydrogen over copper oxide—an experiment which I have satisfied myself by trial can be satisfactorily performed by boys. From either volumetric or gravimetric composition the other follows, because the

densities of hydrogen and oxygen should have been previously discovered.

Similarly, the composition of hydrogen chloride should not be deduced from decomposition of the aqueous solution. It is deduced immediately from the determination of the densities of the gases, and can be verified by synthesis.

Further, with regard to the fact that two volumes of hydrogen and one volume of oxygen do not give three volumes of the combined gas, to the boy who is being scientifically trained the amazing thing is not that the volume is not three, but the remarkably simple numerical relation existing, which necessitates, and at a later stage receives, theoretical explanation. He should at an earlier stage have found that while conservation of mass is a natural law, conservation of volume is not—50 c.c. of alcohol and 50 c.c. of water do not form 100 c.c., &c. The introduction of atoms and molecules is only necessary when the chemical knowledge acquired requires it for unifying otherwise isolated facts. In my own school it is only after about eighteen months' work at chemistry that any atomic theory is introduced. Again, with regard to the formulæ HNO_3 and H_2SO_4 , to me the objections appear unfortunate, because, speaking for myself, I do not introduce either of these formulæ until they have been found; and this determination of the formulæ is very valuable training, because it proceeds along the lines of (a) observation of facts (quantitative), (b) the consideration of the most probable explanations, and (c) verification by independent methods.

The use of a formula to prove a chemical fact is, I know, very common—like Prof. Cohen, as an examiner, I have frequently found it—but this is due to the faults in the teaching, and not to the subject taught; due to the fact that teachers have too much copied university methods and tried to teach chemical theory, and have not employed chemistry as a vehicle for training scientific methods of observation and reasoning.

I am willing to admit that, badly taught, chemistry is not a good subject of education, but neither is any other subject in similar circumstances; further, that chemistry has been taught badly very often in the past, but most other subjects have also been taught badly. I believe, however, that more progress has been made of late years in the teaching of chemistry than in that of most other subjects, and I believe that to the increased activity of the man of science in improving the methods of teaching science is largely due the activity in endeavouring to improve the teaching in most of the subjects of our school curriculum. May we not appeal to Prof. Cohen and to other professors of chemistry not to discourage those who believe in chemical science as a means of education, but to endeavour to assist them by improving the methods?

LIONEL M. JONES.

Central Secondary School, Birmingham.

WHILE probably the majority of schoolmasters will agree with much that Prof. Cohen says in his article of your November issue, many will be surprised at his condemnation of the use of the electric current. A boy carries out the electrolysis of water, and shows that the presence of vitriol, or some other body, is almost essential; he studies the gases evolved, and learns that when the mixture is heated pure water, and pure water only, is formed. The synthesis of water prevents his misunderstanding the electrolysis. He accepts this new power of the electric current, and classes it with its other mysterious actions, such as yielding heat and light, its use for motor, curative,

and voice-transferring purposes. He cannot explain its action, neither is he called upon to do so. If Prof. Cohen's objection is valid, the boy should also be prevented from using that other intangible mystery called heat, and likewise he must dispense with the aid of solution. All three puzzle him extremely if he attempts to explain their action, for, as Prof. Cohen says, heat seems to have totally different effects upon chalk and upon quicksilver. The boy is asked to observe the effects and to try to explain what happens to the substance investigated.

And is it really necessary to guard him from the knowledge of puzzling things? His whole existence has brought before him a constant succession of natural paradoxes. The motion of flame, the buoyancy of balloons and of steel ships, the driving power of screw propellers, the stability of bicycles, and a multitude of everyday sights have baffled his reason; so much so, that the wonders upon which the law of reciprocal proportions is based may fail to impress him. Contrary to the doctrine favoured by a growing section of critics, the schoolmaster is usually the one to revive the boy's belief in reason.

And why should he be denied the happy surprises that astonished and inspired Priestley? The observant boy is likely to be stimulated by them, and they may enlarge in the duller boy the capacity to wonder. The explanation can wait; all too quickly boys begin to think that everything has been explained.

Probably all teachers will agree that the study of physics should precede that of chemistry: but not that the boy may escape the unexplained. How many boys, unaided, will deduce Boyle's law from the results of their experiment and the curve they draw? And when the law is stated, the boy can do no more. He cannot explain it; his attitude is that which he adopts towards the action of the vitriol in electrolysis. The process is mysterious. And, later, he is to be told that men of science believe that not the gas but the unoccupied space is contracted. The explanation is not convincing. And if he accepts the doctrine of molecules he will maintain that these particles must repel each other.

And difficulties as serious will lurk in nearly everything he studies—weight, energy, reflection, radiation, &c. Later, when he makes his start in the world, whatever may be his calling, he must deal with many matters—and control some—which he will not be able to explain. Many teachers have the greatest faith in chemistry as a preparation for him.

E. I. LEWIS.

Oundle.

WHILST fully realising some of the difficulties pointed out by Prof. Cohen, one cannot help feeling that these pitfalls may, to a great extent, be avoided. To take a case in point: it was stated that no powers of observation could enable a child to discover, in experimenting with zinc and acid, that the gas comes from the acid rather than from the zinc, and that he must rely on the statement of the teacher. May I be allowed to describe how the problem was attacked in a class of my own a short time ago?

At the outset it was stated that "it looked as if the bubbles of gas were oozing out of the zinc." They were then reminded of an experiment previously performed, in which they had started with some well-formed crystals of blue vitriol, and by means of zinc displaced the copper, and eventually obtained, from the filtered solution, crystals of a totally different kind. This gave the idea of displacement, and the idea was now connected with the experiment in hand. Not a few thought the two cases might be analogous, and evaporation and crystallisation were suggested as a means of further proof. On finding crystals

of the same kind as before, there seemed little doubt that the zinc had united with part of the acid, and had taken the place of the gas it had "sent out." The further information was volunteered that there must have been something in the acid (dilute sulphuric) exactly the same as in the blue vitriol, because crystals exactly alike had been obtained in both cases. During the operation various questions were asked by these young experimenters, such as: "How do you know that the gas did not come from the water the acid was mixed with?" Or again, "Would there have been a white powder left if the acid had been evaporated before the zinc was put in?" The answers having been satisfactorily demonstrated, the study of the gas itself was begun. Then different metals and different acids were tried, all leading to the same conclusion.

One sees in this and many other experiments of a similar kind opportunities, not only for gaining useful information, but also for the exercise of the faculties of reasoning and imagination. This, combined with the necessary care in arranging and fitting up apparatus, must surely be discipline of a most sound order. Would it not be dangerous to allow that the discovery of pitfalls is in any way beneficial to the young student? Rather try to do away with the pitfalls, and there still remains a wide field wherein to work.

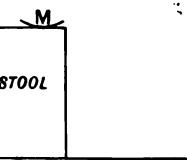
MAY BATEMAN.

The Mount School, York.

The Refractive Index of a Liquid.

MR. JORDAN'S method of finding the refractive index of water is so good, that I venture to describe a modification of it which is suitable for a large laboratory class. Good concave mirrors of about 60 cm. radius of curvature can be procured at 1s. 10d. each. If one of these is laid on a flat stool, the point of a pin held by the clamp of a retort stand, and projecting over the edge of the table, can easily be adjusted so that it coincides exactly with its own image formed by the mirror.

If the mirror is filled with water, the pin can be lowered so as again to coincide with its own image. The distances of the pin from the mirror are measured with a metre scale, and in this way a class of students can obtain results correct to two places of decimals. If other liquids than water are used, precaution must be taken to protect the silvering at the back of the mirrors.



W. D. EGGER.

Eton.

Seeds and Seedlings.

TEACHERS of nature-study sometimes cast about for suitable subjects to occupy the attention of their classes during the winter months. May I recommend the study of seeds and seedlings? It is useful to reserve the fascinating questions connected with the germination of the seed and the growth of the seedling until the time when subjects are rather scarce.

In order to be able to carry on this work without undue delay, some method of supplying artificial heat is almost necessary. The best method is to have a germinator, with a tray of damp sand standing in warm water. It may be of assistance to some teachers if I describe a convenient form of germinator, a form which has been successfully

used by us in Leeds. Fig. 1 gives the general appearance of the germinator, and in Fig. 2, which represents a section, the internal details are shown. The floor of the water-bath (Fig. 3) must be very strong to support the weight of the water and the sand tray. The sand tray is raised above the floor by six hollow supports, which are fastened to the floor and sides of the water-bath. The sloping lid is useful to allow the condensed water-

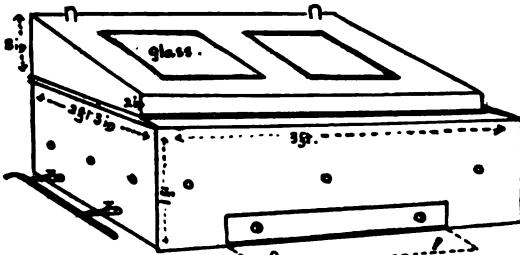


FIG. 1.

vapour to run down into the tray again. The sand tray is made of zinc, but the rest of tin. We use gas as the source of heat, but a lamp could be utilised; and my colleague, Dr. Smith, tells me that an electric incandescent lamp (16 candle-power) in contact with the underside of the bath floor will be sufficient. As the water in the bath evaporates it must be replenished, and the sand must be kept damp. The seeds can be germinated in porous

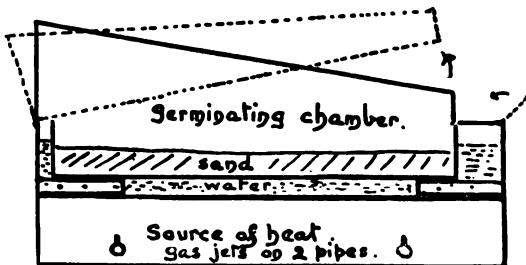


FIG. 2.

saucers placed upon the sand, but if older stages are wanted the seeds can be sown in boxes of sawdust or even in the sand. With such a germinator it is possible to enlarge the scope of the seedling work very considerably.

I indicate below a very rough outline of work:

1. Study the sequence of events in the growth of beans and maize, and follow this by an examination of the main

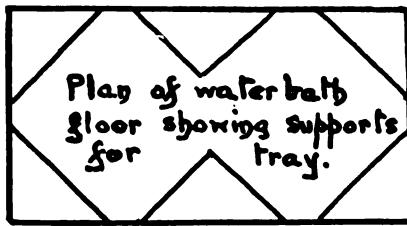


FIG. 3.

features of a series of the seedlings, starting with the oldest and working back to the seed itself.

In order to have a sufficient number of stages for examination, seeds must be sown at intervals of a day or two. In the germinator, a seedling which takes from four to five weeks in the open can be raised in a fortnight.

2. Compare the seedlings of oat, melon, date, pine, onion, lupine, mustard; take note of (i) how the embryo

escapes from the seed coats, and (ii) the source of food, its position with reference to the embryo, and (iii) the method of its absorption by the embryo.

I hope that many teachers will undertake new work. The stages of the bean and maize form, no doubt, the best introduction to the study of germination, but in the comparative study of a variety of seedlings there is a wide field of inquiry, which will furnish the enthusiastic teacher and class with new and interesting work.

3. Elementary experimental work. (a) To show position of maximum growth in a radicle. A germinating pea with a short, straight radicle is marked along its length with equidistant dots of Indian ink. The pea is so arranged that the radicle will continue its growth down the tube of a thistle funnel. A watch-glass on the top of the funnel and a piece of damp blotting-paper inside will make an effective damp chamber for the seed; the lower end of the thistle funnel passes through a cork into a bottle of water.

(b) In order to show the position of curvature a pea or bean is suspended by a needle to the cork of a large bottle so that the marked radicle is horizontal. The air in the bottle can be kept damp by blotting-paper or a small sponge.

(c) The stimulus of gravity can be demonstrated by tilting a bottle in which a bean radicle has been growing straight down.

(d) The stimulus of light is best shown by germinating seeds of castor-oil or sinapis upon muslin stretched across a tumbler, and then placing the tumbler in a black box which has one small aperture for the entrance of light.

(e) The stimulus of moisture can be demonstrated by means of castor-oil seeds germinating in damp moss in a sieve. If the sieve is suspended in a bell jar in which the air is kept damp, the radicles will grow downwards through the meshes of the sieve; they can be induced to ignore gravity for the time being by soaking the moss with water. The experiment should be performed in a dark cupboard, to eliminate the effect of light.

(f) Experiments are easily devised to show the evolution of carbonic acid gas and heat when seeds germinate.

4. Advanced experiments can be tried by the older children, who will take a keen interest in devising the apparatus for them. Any book dealing with plant physiology, such as Darwin and Acton's, will suggest suitable experiments; but I should like to direct the attention of teachers to the excellent article upon this subject communicated by Prof. Miall to the August, 1902, number of THE SCHOOL WORLD. This article should certainly be in the hands of all teachers wishing to undertake seedling work.

ERNEST E. UNWIN.

University of Leeds.

The Board of Education on the Teaching of Latin.

The circular recently issued by the Board of Education on the teaching of Latin is remarkable both for what it contains and what it does not contain.

To take the last point first. It is noticeable that there is no reference in the memorandum to the special disciplinary virtue which the classicists try to persuade us is inherent in Latin. The Board, indeed, alludes to its value as "a corrective to the loose phrasing which easily arises from the syntactical freedom of modern English," but this, though by no means an unimportant matter, is a comparatively small claim. What is to be noted is that the old idea that Latin possesses some mysterious power to develop the intellect which is not shared by any other study is not so much as hinted at in the circular. The argu-

ments in favour of teaching the language are all frankly based on the higher utilitarianism. Not Latin in and for itself, not Latin as a mental gymnastic, or a grindstone for youthful wits, but Latin as the key to a considerable section of human knowledge is what we are called upon to support. This acceptance of the principle that children are to study the subjects which are, in the best sense of the word, useful, is no doubt a great step in advance, but when we examine the particular utility which is claimed for Latin, we find less reason to acclaim the wisdom of the Board.

The first reason for including Latin in the curriculum is thus stated : "No study of the development of European institutions is possible without a knowledge of Latin, for in it are contained the records of the development of law, religion, literature, and thought." As the Board can hardly intend to suggest that the children in our secondary schools are to study the development of European institutions in books written in Latin, we are forced to the conclusion that the language is to be studied for the benefit of the few who will hereafter become historians and workers in research, and who, being presumably of superior intellectual powers, could easily learn Latin for themselves when they found the necessity for it. But it would be easier to appreciate the Board's arguments if one could understand the Board's language. What is meant by "the records of the development of law, religion, literature, and thought"? "The development of law and religion" is an intelligible phrase, though it may be remarked in passing that the records of the development of the national religion of this country are written mainly, not in Latin, but in Hebrew and Greek; but what is "the development of history"? If this ambiguous phrase means simply the history of Europe, why should Latin be named as the language in which its records must be studied?—unless, indeed, the authors of the circular regard "the development of history" as having come to an end in the sixteenth century. What, again, are "the records of the development of literature"? What can they be except the books themselves which constitute literature, which are written, not exclusively or even mainly in Latin, but in all the languages of Europe? Indeed, the language in which the development of literature can best be studied is probably French, which has had an uninterrupted literary history of a thousand years; certainly not Latin, which has scarcely any monuments earlier than the golden age. As for Latin being the language of "the records of the development of thought," the only meaning it seems possible to attach to this is that the authors of the circular consider that the human mind has stood still ever since Bacon wrote the "Novum Organum." The whole sentence, indeed, suggests that there is some Rip van Winkle at the Board of Education who has just awakened after a sleep of three hundred years, and in whose view Latin still holds the place that it did in the Middle Ages as the sole key to learning and philosophy.

Next we are told that "Latin is an essential instrument for the educated use of the vocabulary of English." There is no need to argue this point, for the statement contains its own refutation. "Educated use" is a phrase of which a schoolboy might be ashamed. If the result of learning Latin is to write English as badly as this, we can do very well without it.

Thirdly, the Board holds that "a knowledge of Latin is necessary to any scientific study of the Romance languages." Grateful as one is for a proposition which is at once intelligible and indisputable, one is bound to ask again whether the Board desires Latin to be taught solely for the benefit of the very few who will devote

their lives to linguistics? It would really seem as if the authors of the circular believed that the principal business of schools is to train antiquarian and linguistic experts, or that mediæval research is the ordinary occupation of Englishmen in the twentieth century. Anyone who adopts either this view or that of a Rip van Winkle in Whitehall will find support for his theory in the absence of any allusion in the circular to the necessity of Latin for doctors and lawyers. Possibly, however, this curious omission may be due to a fear of yielding to the lower utilitarianism and to a contempt for base theories of education which regard the intellectual equipment of a boy for his work in life as part of the business of schools.

The claim that Latin is "the most valuable help to understanding the general principles of European languages" is decidedly a bold one. That you can understand German better by studying Latin, with which it has only a distant connection, than by studying German, is a theory which requires a good deal of argument to support it, argument from which the authors of the circular, perhaps wisely, refrain. No doubt one language will always throw light upon others, and the comparison of a highly synthetic with a partially synthetic language is a particularly instructive study, but it is quite another thing to hold that a boy or girl who has only eight hours a week to give to modern languages will do better to devote four of them to Latin than to give the whole, eight to French and German.

If, as may fairly be presumed is the case, the framers of the memorandum themselves learnt Latin, the conclusion to be drawn would seem to be that one effect of classical studies is to produce a class of departmental officials whose intellectual sympathies are confined to linguistic study and mediæval research, who think it more important that one man should read *Magna Carta* in the original Latin than that a thousand should understand it in English, and that it is better to be capable of deciphering painfully an ancient chronicle than to be able to read with interest and intelligence a modern poet or philosopher.

Since writing the above I have read the report of the Classical Association on the teaching of Latin, and I see that this body also considers that "Latin is a necessary preliminary to the study of the origin of modern institutions." It could be wished that the authors of this report had explained more clearly what they meant. If the word "study" is to be understood in the sense that it is understood by men of learning, everybody will agree with the dictum; but then are we to teach Latin to three or four hundred boys because possibly one or two will need it in after life for the purposes of research? On the other hand, if by "study" is meant no more than the intelligent acquisition of such an ordered knowledge of the subject as every well-educated man should possess, then Latin is not necessary. Anyone who has read Stubbs, Hallam, and Erskine May will be pretty well acquainted with the origin of English institutions, even if he leaves out the notes, the only portions not written in the vulgar tongue.

G. F. BRIDGE.

University Work in the Training Colleges.

THE recent Government action with regard to the training colleges, tending to make them less strictly denominational in character, has called forth much comment in the Press, and many conflicting views have been expressed as to the wisdom or otherwise of the new regulations from Whitehall.

In contrast to this, it is extraordinary to remark how very little has been heard of the great change of attitude

adopted by the Board of Education with regard to university work in the training colleges; yet this is a matter which is not a whit less important to the teacher and to his future than the question which is now so prominently before the public.

The most important part of a student's work in the training college is that relating to his professional career. We all agree here. Therefore, in order that there may be no danger of neglect on this side—assuming this to be the real reason—the Board is curtailing and hedging in with many conditions all university work. This branch of the college curriculum is to be discouraged and neglected in future—for what? Presumably for the "normal" work. What does this mean? It means that the only really efficient side of the training college courses—as they stand at present—is to be abandoned or neglected!

Were the colleges really "training" institutions, one might perhaps admit the wisdom of the step under consideration. But does the Board not realise that at present the "normal" side of the average training college is in a terribly weak state, so weak in some cases as to be nothing more than a mockery? Students are *not* trained to teach in our "training" colleges, and if the university side is to be discouraged then I earnestly hope that student teachers will spend their time and money to better advantage by taking the courses at such institutions as King's College, or University College, London. So long as the normal and training work continues to receive, as at present, such an utterly inadequate and unsatisfactory treatment, the good man will gain very little by entering an ordinary training college. For he will receive but a mockery of "training," while he will be enabled to get very little nearer to the completion of his degree.

There is another aspect to this question. This retrograde action on the part of the Board comes at a time when there are distinct signs that the State teacher is beginning to realise the importance of his profession, and the status he should and could occupy. He realises that he needs particularly: (1) wide practical experience in the schools, coupled with a broad and complete theoretical knowledge—this will make the teacher, the man who understands his profession; (2) academic qualifications—these will give him a proper status, and will define his relation to the other "learned" professions, besides giving him an adequate mental discipline and knowledge to fit him for the work of teaching.

Can it be that there is some insidious working of caste and of class-prejudice behind the action of the Board which is tending to keep the skilful and clever teacher from a position which he honestly deserves? Or, is it that the Board is merely overestimating the value of the "training" which is at present given in the State colleges?

Why has the Government not taken a step in the *forward* direction by affiliating all colleges directly to the universities? Student teachers could then graduate as internal students by taking philosophy and education as compulsory subjects for "Final," while the remaining two branches could be chosen from the "Arts" or "Science" side, according to the bent and capabilities of the student. The theoretical work in pedagogy would then be covered in a far more adequate manner than at present, the "certificate" examination would be unnecessary, while every student would be required to pass a practical examination similar in type and extent to that in the teaching test for the London University Teacher's Diploma. The student would then have the satisfaction of knowing that not only was he obtaining the necessary theoretical and practical knowledge for the practice of his

profession, but at the same time he was completing his academic qualifications.

It would be interesting to gain the opinions of your readers on these matters, for undoubtedly this action on the part of the Board of Education in discouraging university work in the State training colleges will tend to keep the best men from the teaching profession. Moreover, it will prove a tremendous bar to the realisation of the hopes of all enthusiastic teachers—that they should come to be regarded as a body of men and women "constituting the most important profession in the world" (*vide* H. G. Wells, "Anticipations").

JOHN MILES.

Hornsey Higher Elementary School.

The National Home-Reading Union.

MAY we ask for the freedom of your columns to direct the attention of your readers to certain important developments which have recently taken place in the work of the National Home-Reading Union?

We feel that there is hardly any field where our work may be more helpful than in the schools where the gift of reading is being imparted to children, and we have therefore made special efforts this session to render more attractive and pleasing than usual the books which have been selected for reading, and the magazines which contain articles dealing with the books. We are anxious to assist teachers in creating and fostering amongst children a love of books which are good and healthy, and in preventing habits of careless reading. We believe that our reading circles may be very helpful towards this end. They are a means of directing the reading of children at home for two years before they leave school, of familiarising them with some of the best books suitable to their ages and tastes, and of awakening such interest and pleasure in the reading of these books as will lead them to eschew others of a worthless kind. They supply also a link between the school and the home, and not only induce the elder children of the school to spend part of their evenings in a pleasant and useful way, but also make the influence of the school and the books which the children are reading felt in the home.

We shall be glad to send specimen copies of our magazines and full information to any of your readers who may be interested in this letter, and we will gladly welcome any co-operation they may feel able to give in this branch of our work.

J. B. PATON (Hon. Secretary).

A. M. READ (Secretary).

Surrey House, Victoria Embankment, London, W.C.,

November 19.

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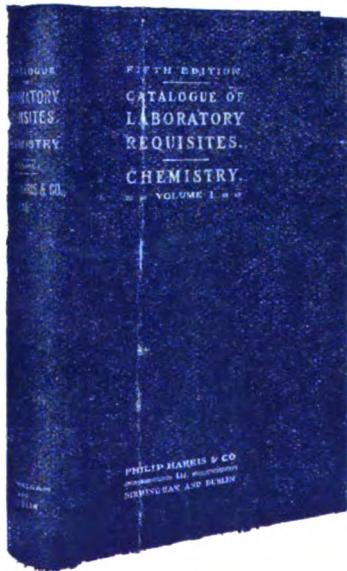
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